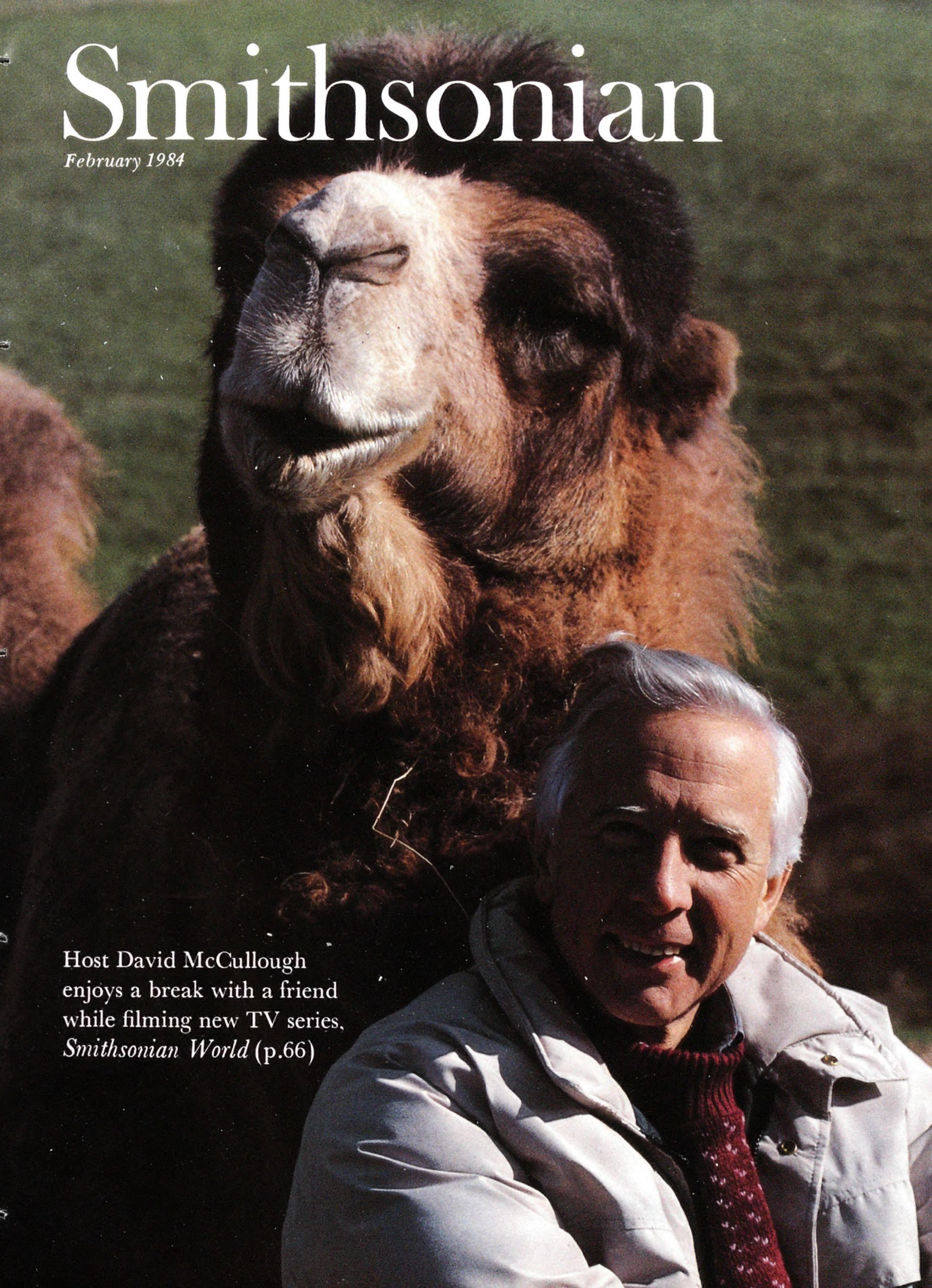
Smithsonian

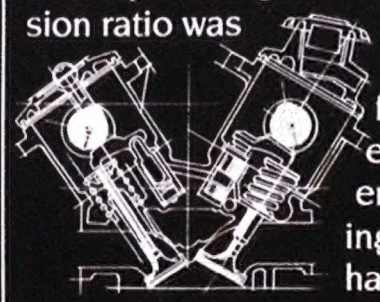
February 1984



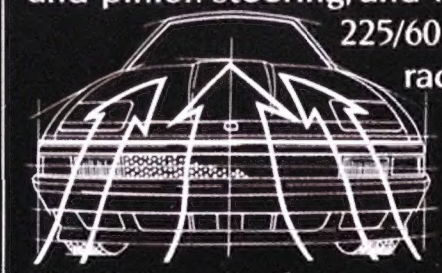
Host David McCullough enjoys a break with a friend while filming new TV series, *Smithsonian World* (p.66)

© 1983 Toyota Motor Sales, U.S.A., Inc.

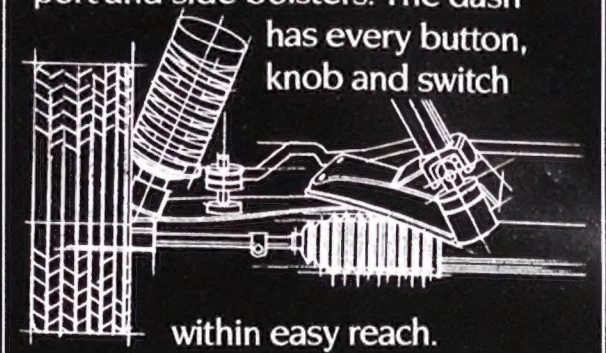
The Toyota Supra. A sleek and powerful driving machine. Smoldering beauty. Scorching performance. An automotive legend in just three years. How does a car earn such a glowing reputation? The answer begins under the hood, the heart of every performance car. For 1984, the 5-speed Supra has been refined, squeezing 10 more horsepower out of its already hot engine. The compression ratio was raised, the intake manifold enlarged for easier engine breathing and the exhaust system streamlined. As a result, the electronically fuel injected 2.8 litre Twin-Cam six propels Supra from 0-60 in less than 8.6 seconds.



In the handling department, standard features like independent rear suspension, MacPherson struts, variable assist power rack-and-pinion steering, and wide 225/60 HR14 radial tires on 14"x7" aluminum alloy wheels, give Supra superb cornering and precise control. A new front air dam was added to channel the wind for less resistance and even better road holding.



Inside the Supra, uncompromising attention has been paid to create the ultimate high performance environment. The Supra's now famous 8-way adjustable sport seat won't take a back seat to anybody else's. In a review of the ten best automotive features, Car and Driver Magazine rated the Supra driver's seat as the best in the business.* The driver's seat has a wide variety of adjustments from a unique pneumatic lumbar adjustment system to movable thigh support and side bolsters. The dash has every button, knob and switch within easy reach.



The 1984 Toyota Supra. Superb performance and stunning beauty. The right stuff to make a car a legend.

* Car and Driver Magazine, January 1983

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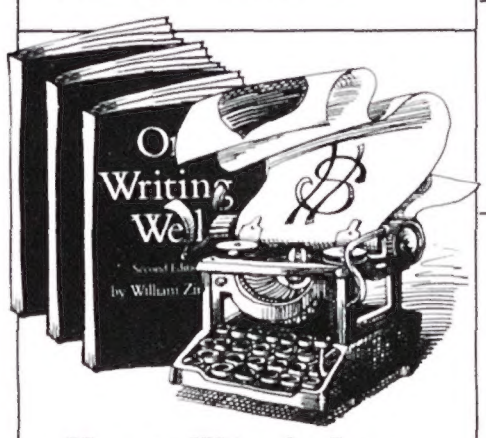

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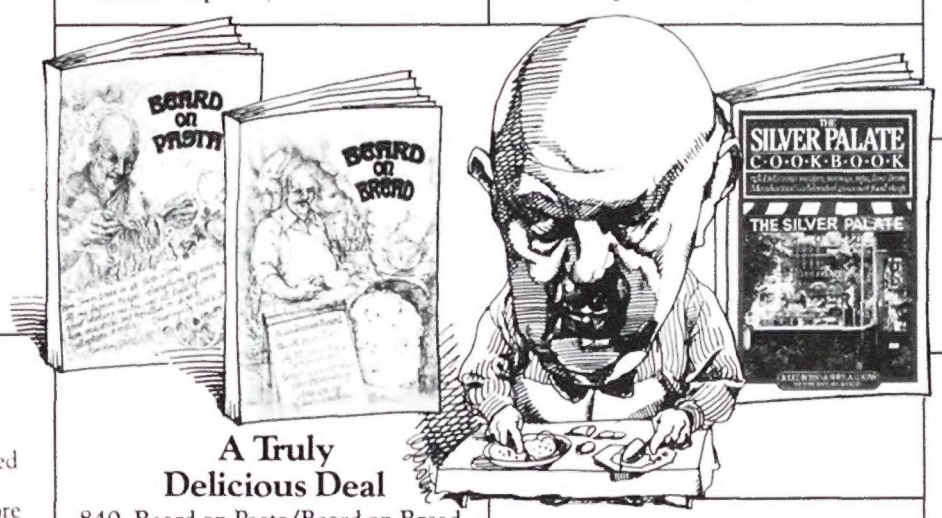

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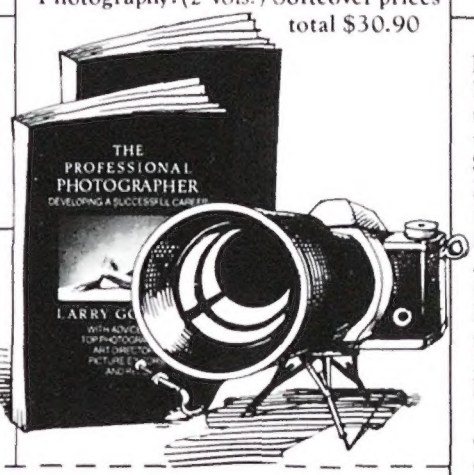

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February 1984

Smithsonian

Volume 14, Number 11

Table of Contents

Cover: While filming *Smithsonian World*, host David McCullough is nudged by a Bactrian camel (p. 66)
Photograph by Kenneth Garrett/Woodfin Camp

12 *The view from the castle* by Secretary Ripley
14 *Letters to the Editor*
26 *Around the Mall and beyond* by Edwards Park
30 *Picture credits*
34 *Phenomena, comment and notes* by John P. Wiley jr.

42 **A new way to help children 'without language'**
In two important programs, talking computers unlock their abilities to speak, read and write
By Paul Trachtman, photographs by Enrico Ferorelli

54 **Marisol's movers and shakers**
From wit and whimsy the sculptor has turned to making trenchant portraits of artists and leaders
By Avis Berman

66 **The making of *Smithsonian World***
The host of the Institution's new TV series tells how it was shot on location here and abroad
By David McCullough

78 **Where tomorrow's cars are taking shape**
Manufacturers around the world now see Pasadena as an important outpost of the auto industry
By Ellen Ruppel Shell, photographs by Peter Menzel

88 **How to manage multiplying mustangs**
Wild horses are overrunning their habitat, but a new antifertility drug may rein them in
By John W. Turner jr.
Photographs by Michael Mauney

100 **Boontling: not ready to 'pike to the dusties'**
A lingo peculiar to Boonville, California, is fading but not yet headed for the graveyard
By Jack Fincher, illustrations by Arnold Roth

112 **The glass people's glass people**
The Shefts brothers of the Bronx have revived the delicate art of carving glass by sandblasting
By Phil Patton, photographs by Don Carson

120 **Big ideas in small packages**
In the 19th century, America's inventors sent in tiny replicas along with their patent applications
By George Nelson
Photographs by Yale Joel and Kim Nielsen

128 **Looking for the dark condiment**
Pepper is one of the great motivating forces of history; even Columbus went sniffing for it
By Robert Wernick

150 *Book reviews*
161 *Additional reading*
163 *February events at the Smithsonian*
170 *Smithsonian tours*

172 **Celebrated birthdays**
By David Snell

Smithsonian (ISSN 0037-7333) is published monthly
by the Smithsonian Associates, 900 Jefferson Drive, Washington, DC 20560.
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Subscription price $17 a year in U.S. possessions, $25 elsewhere.
80 percent of dues is designated for magazine subscription.
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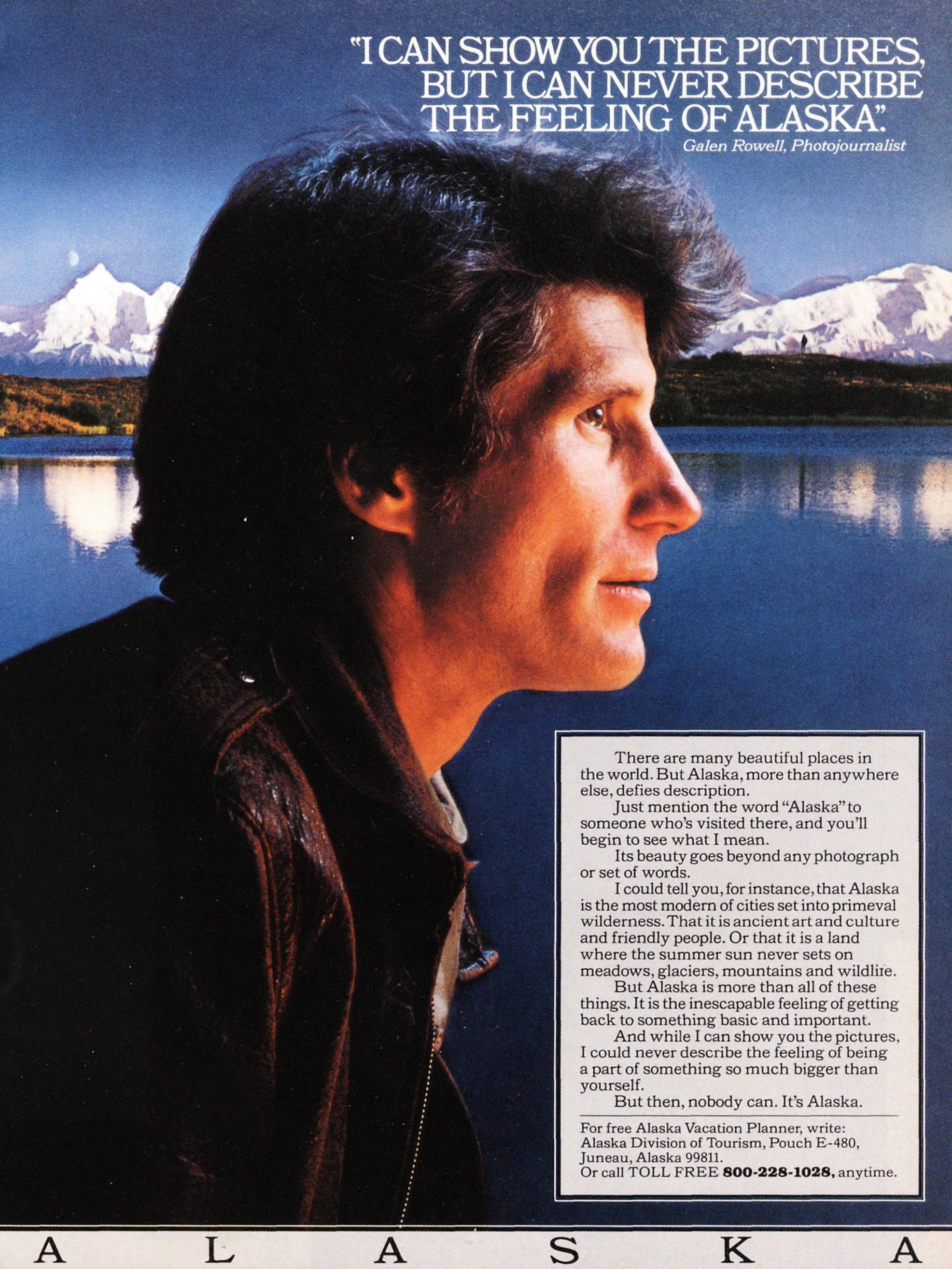

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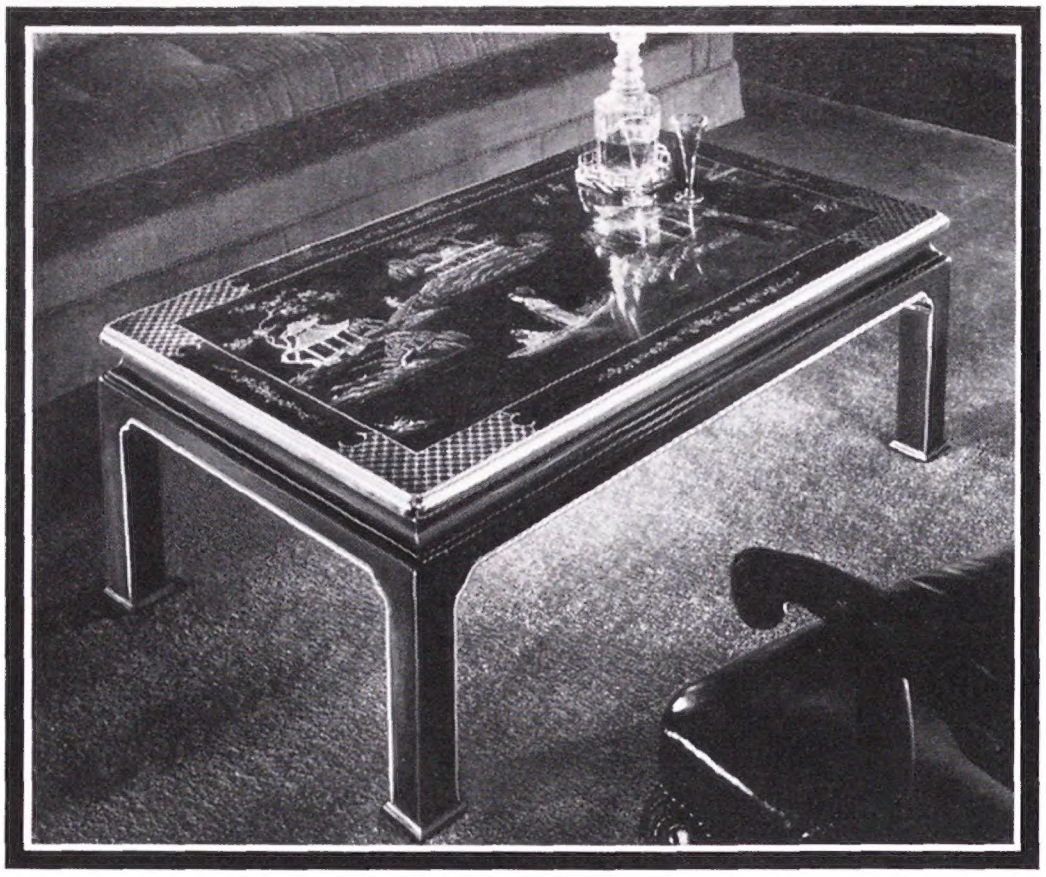

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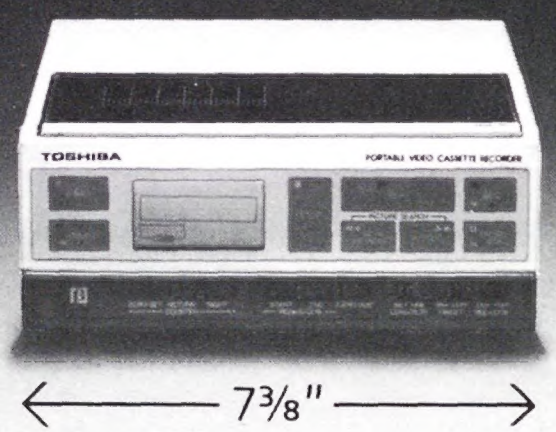

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The view from the castle

Our SmithsonianWorld, *a new educational television series, is now appearing on channels of the Public Broadcasting Service*

For years we at the Smithsonian, perhaps preoccupied with research and public education on our own campus, so to speak, have explored only superficially the vast realms of television. Ideally, television is not only an instant recorder of current happenings, but also a powerful tool for education, a kind of all-embracing McGuffey's Reader, capable of conveying a wide variety of information and skills. Since the beginnings of radio in the 1920s and the more recent advent of television, many people have held the persistent conviction that these new media could transcend the printed word and the classroom to serve as major vehicles for education.

For some time now the Smithsonian has produced highly successful radio programs that are not only popular but that succeed in transmitting truth, an imperative in our view. More recently the Institution has experimented with television, and some of the short productions of our own staff have been both well-received and highly meritorious.

Now, in partnership with WETA, Washington's public television station, we are launching a much more ambitious project—*Smithsonian World*. This series of seven one-hour documentaries—the second program, "Crossing the Distance," will appear this month—will be shown throughout the year on channels of the Public Broadcasting Service, which, by its mandate, holds this country's best hope for authentically educational television.

The programs have been funded by a grant from the James S. McDonnell Foundation, and created by a team under the direction of award-winning producer Martin Carr. The series host is David McCullough, historian and author of such widely acclaimed books as *The Path Between the Seas* and *Mornings on Horseback* (Mr. McCullough's behind-the-scenes story on the making of the series begins on p. 66).

The Institution is much more than a repository of objects in a complex of museums on the Mall and elsewhere. Our interests are wide-ranging, covering many aspects of the natural world and of human development and culture. This diversity of interest is evident in SMITHSONIAN magazine, and also in the documentaries of *Smithsonian World*. Some of the segments have to do with things in our own museums, from Whistler's famous Peacock Room in the Freer to the great Foucault pendulum in the Museum of American History. Other segments cover the work of the Institution's scientists and scholars in the field, from iguana research in Barro Colorado to the cosmological quest with the Multiple Mirror Telescope on Mt. Hopkins in Arizona. Still others range beyond the Institution itself, exploring subject areas in which the Smithsonian has a serious interest.

I have always thought that education should be fun. There is little point in treading the hard road to knowledge unless one finds beauty and joy in enlarging perceptions. In *Smithsonian World* you will meet a group of scholars and scientists—perpetual teachers—who find joy in the refinement and perfection of truth. For Smithsonian Associates, who care about the Institution in a special way, we hope the series will offer still another window on our affairs and our concerns.

S. Dillon Ripley

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Letters to the Editor

The common cold

Dear Sir: As an R.N. I am continually amazed by the lack of focus on those who do not get colds. Scientific research has proved that not everyone who is exposed gets sick. For example, if someone in the contagious period of a cold is in a room with 20 people, only a portion of the 20 will become infected.

I have never understood why our research does not focus on those who don't catch the cold—or for that matter those who live to be 95, breaking all the rules of prudent health care along the way. It seems only logical that the healthy group holds the key to prevention of all types of illness. Studying those who get ill seems to me rather like studying the efficacy of seat belts on those who put them on after an accident has occurred.

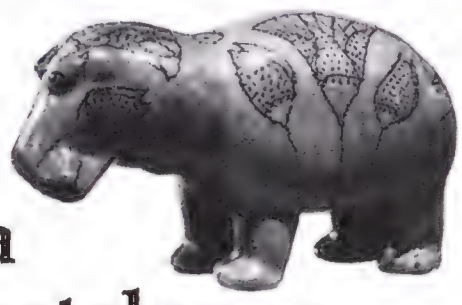
Kathleen Stine
Hyattsville, Maryland

California condor

Dear Sir: After reading your December 1983 article, I wonder how, if the pro-endangered-species people had been around in prehistoric times, we would now feed all those triceratops and tyrannosaurs? The feed bill would exceed our national debt. Of course there could be some advantages—perhaps we could get rid of our garbage. But gosh, how could we transport it to the Imperial Valley?

Anyway, let us hope the little condors will grow up to be big condors and that they can take care of their own.

Carl Faris
Glendale, California



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Dear Sir: William Weber Johnson's article provided a glimmer of hope for this awesome and nearly extinct bird. Efforts to save it must proceed vigorously.

Since your article went to press, blood tests have shown that Cuyama, the chick taken into captivity in August 1983 and now in the Los Angeles zoo, is a male, and the chick being fed by a puppet parent on page 79 is a female. She has been named Cachuma, and is also in the captive-breeding program in Los Angeles.
Philip K. Ensley, DVM
Associate Veterinarian
Zoological Society of San Diego

Chelsea Hotel

Dear Sir: Helen Dudar's article brought back a memorable evening in the late 1940s. Gilbert Maxwell, the Georgia poet, was recuperating at the Chelsea, having broken his hip while trying to hang a sign at a summer theater on Long Island. Gil was a demanding patient, and one night a few of us threw a party in his room to take his mind off his misery. Several budding poets and writers were there—some now famous—but the star was Gil's old friend, Tennessee Williams.

Williams sat out the entire evening on the balcony, writing furiously. He was working on *A Streetcar Named Desire*. Being back at the Chelsea had fired up the muses that had rescued him from the mundane job he held upon arriving in New York a few years before. The job? Running an elevator at the Chelsea.
Nancy R. Charlton
Cornwall Bridge, Connecticut

Dear Sir: What a whir my memory drum did as I read this fascinating article! At 83 years of age, I want to horn in even if not one of the Chelsea famous. During the apple-selling Depression I worked on a magazine called *Knott Knotes* in an office in the Chelsea, to earn extra $ to eat standing up in Nedick's (juice, doughnut & coffee 15¢ and no tipping). I survived! My congrats to the old dowager. How I wish I could see her interior now.
Ceil Smith Thayer
Caldwell, New Jersey

Culinary Institute

Dear Sir: Jane Howard's excellent serving up of the Culinary Institute of America breaks down when she leaves the kitchen for the library. The *Dipnosophis-*

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tarum of Athenaeus is not "a dialogue between two men at a banquet. . . ." It is Athenaeus' account to a friend of a banquet attended by many guests, all distinguished in their special fields of learning. As the first paragraph says, ". . . there is no sort of gentlemanly knowledge which he does not mention in the conversation. . . ."
Leonard N. Beck
Arlington, Virginia

Dear Sir: As a woman with knowledge, insight and experience in food service, I find it impossible to swallow pertinent facts in Jane Howard's article.

She does a grave injustice to the valiant women who voluntarily served their country during World War II in the Women's Army Corps—in which I was a First Lieutenant, Mess Officer. At Ft. Oglethorpe, Georgia, and other military installations, enlisted WACs operated the kitchens of mess halls with no men to lift heavy pots. Moreover, beef was issued by the carcass, delivered and carried by WACs into the kitchens, where other WACs would cut the meat to fulfill the requirements of the master menu.

In New York City, Stouffer's and Schrafft's are but two restaurant chains that were successful for years with kitchen crews exclusively of women.

As a food-service consultant for 31 years, I submit that women members of the food-service industry are progressive and constantly seeking ways to upgrade their business operations.
Ruth E. Preschley
Evanston, Illinois

Orient Express

Dear Sir: How much does it cost to take a trip on the new Orient Express from London to Venice?
Douglas J. Judah
Temple Terrace, Florida
March 1 to 31, fares from London to Venice are $680 double, $850 single; after April 1, $720 double and $900 single. All meals are included, but the champagne is extra. Ed.

Giant panda

Dear Sir: Ruth Harkness had a great asset, Quentin Young. The Young family cannot be dismissed simply as "guides." They were not peasants. Most were Hawaiian or American-born and edu-

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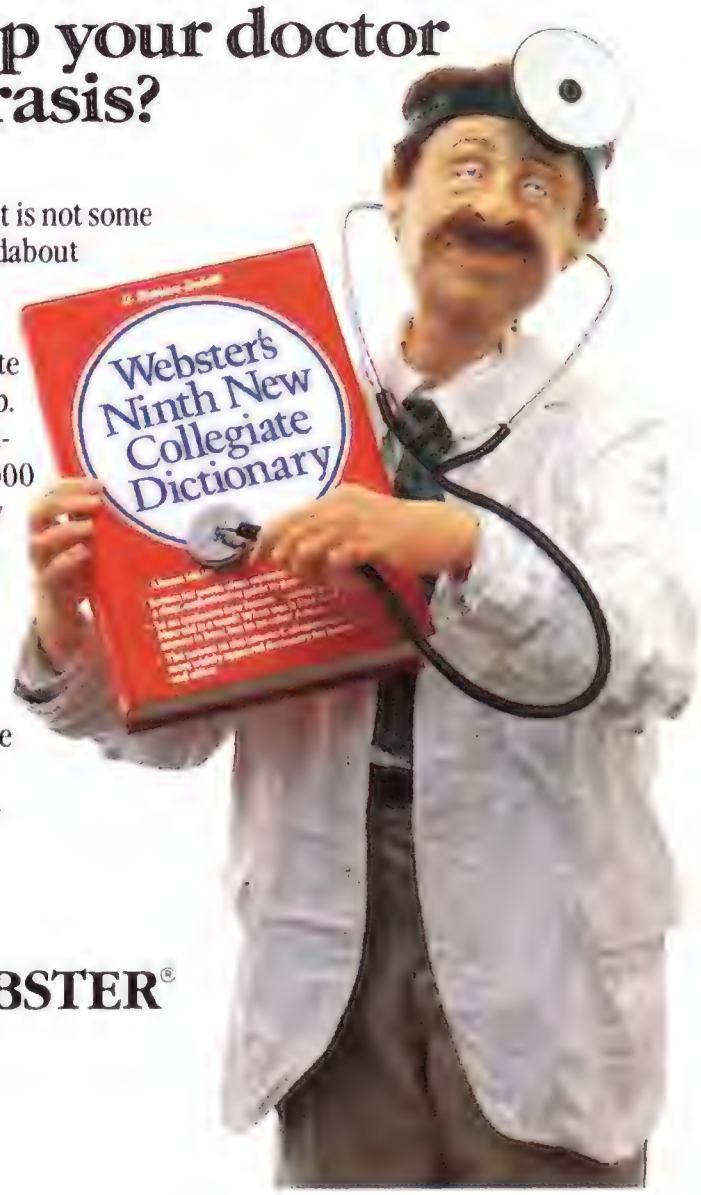

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cated in the United States. Jack was perhaps China's most qualified naturalist at that time. Quentin, an educated young man, was fluent in English, his native Cantonese, Mandarin, Shanghai and Szechwan dialects.

Admittedly, it was an extraordinary piece of good fortune that Quentin heard that tiny whimper, but it certainly was not the big game he sought on this, his grand adventure away from the shadow of his brother Jack. There is no way the 20-year-old would have contrived to have that minuscule animal the end result of all his effort. In fact, it was humiliating to him to find out that Ruth Harkness was satisfied with this infant creature.

As to your statement that none of the principals in the saga of Su Lin enjoyed a happy ending, you are wrong. The principal character in that little drama has not come to his end. Quentin Young, now 70, is very much alive. I am he.

Later in life I brought down from Szechwan pandas for museums and, now to my great sorrow, innumerable pelts. With regard to the latter, you have made me proud to think that perhaps this one small act in my life has been a rallying point for the preservation of all endangered species. You see, we *all* acted out of some degree of ignorance.

My brother Jack and I were neither "bearers" nor companions. We were the working naturalists. How thrilling it has been to be a part of something that has touched the hearts of children and of the child that remains deep in all adult hearts. Now, let us wait with hope for Ling-Ling in Washington.

Quentin Young
San Diego

Dear Sir: I well remember the demise of Su Lin. I was a pediatric resident at St. Luke's Hospital in Chicago, and Dr. Paul Holinger told me that he had received a phone call, allegedly from the Brookfield Zoo, to come immediately to care for their panda, who was choking on a twig. Since it was April first and on that date "Mr. Fox" or "Mr. Wolf" were always calling from the zoo with some crazy request, he dismissed the call as a prank.

Dr. Holinger was the most prominent bronchoscopist in the Chicago area at the time and most certainly would have made himself available had it been any other day. He always felt very badly about this.

Harry O. Ryan, MD
Altadena, California

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Ranch art

Dear Sir: Sometimes we confuse learned or programmed concepts with creativity. Artists such as Picasso, Monet, Cézanne or Matisse have been prime creative individuals. Their minds and bodies personally fabricated the works that led the world to appreciate and admire their art. Your article about the works of Alan Wood encourages and sponsors mediocrity in the arts.

Are we at a time in history where imitative mediocrity should dominate over prime creative thinking and production? We know and deserve better if we expect to survive and flourish as a civilization.
Elliott Balter
Skokie, Illinois

Origins

Dear Sir: Hieronymus Bosch painted a singular picture of Christ as a toddler on the reverse of his *Christ Carrying the Cross*, left panel of a triptych which includes the *Calvary* and *Descent from the Cross*. The naked little boy, painted in *grisaille* (black and white), is supporting himself by holding onto a three-wheeled walker and, in his right hand, carries an odd little pinwheel or windmill [below].

Charles de Tolnay, the late Bosch scholar, saw this picture as the Christ Child's "first and innocent stage of his journey through life" to be played out at last in the Crucifixion.
Paul Elbogen
San Francisco

Infant Christ, Hieronymus Bosch, c. 1500

Kunsthistorisches Museum, Vienna

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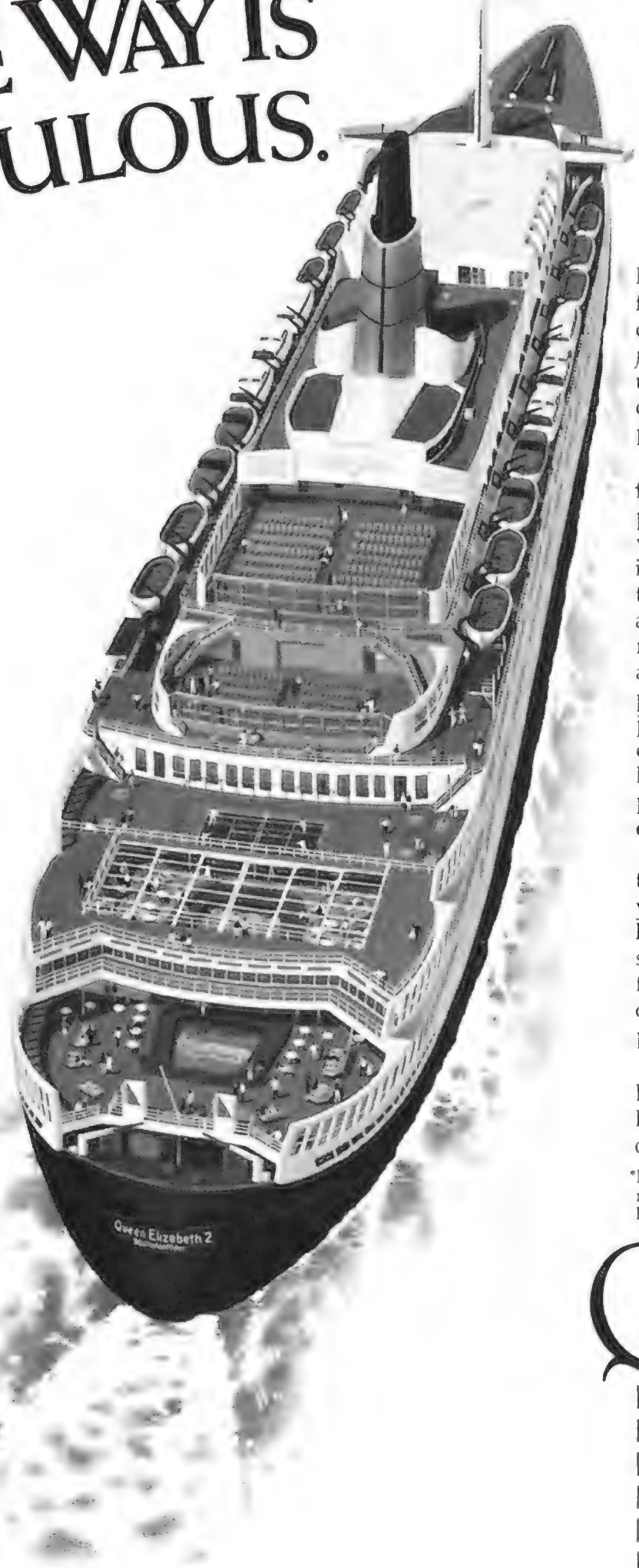

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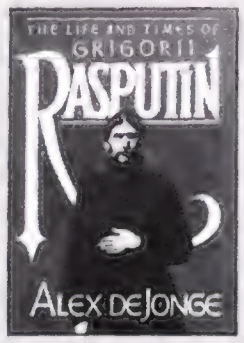

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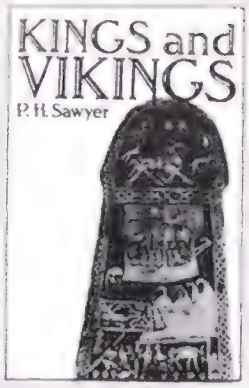

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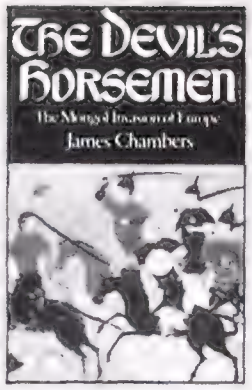

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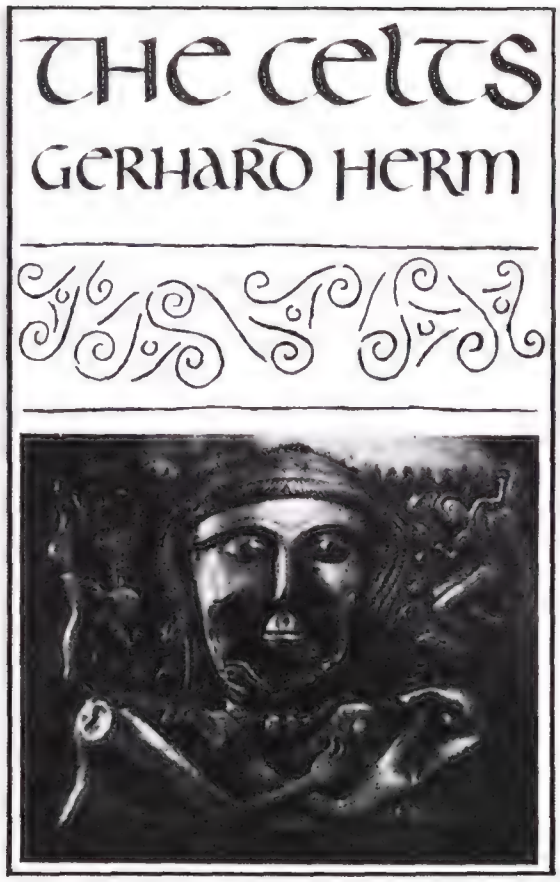

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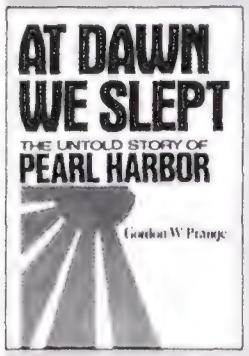

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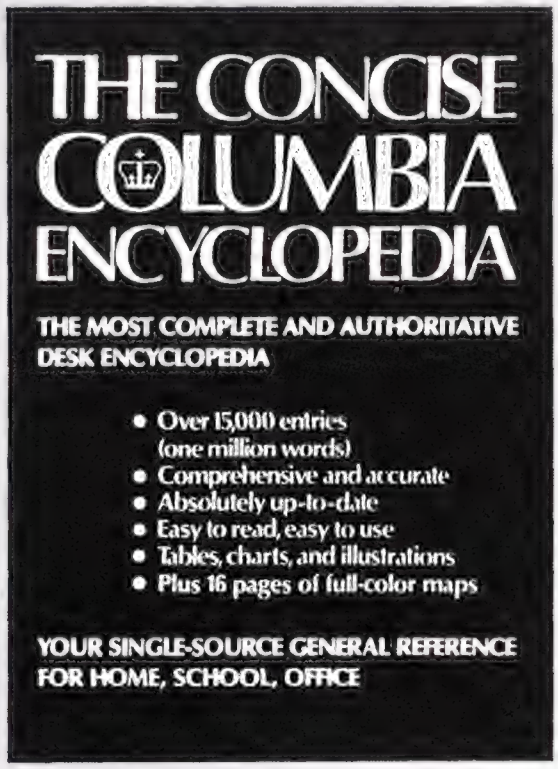
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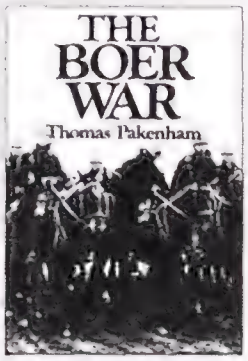

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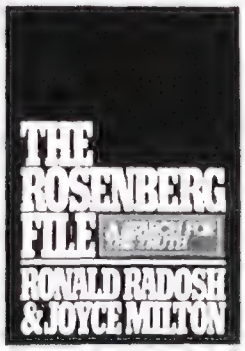

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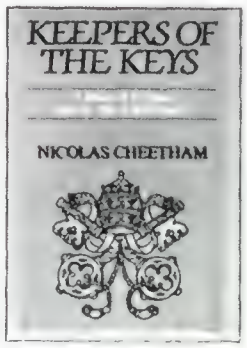

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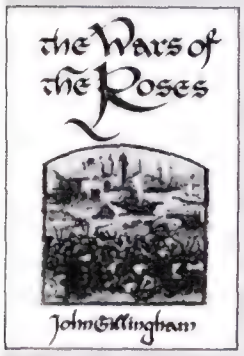

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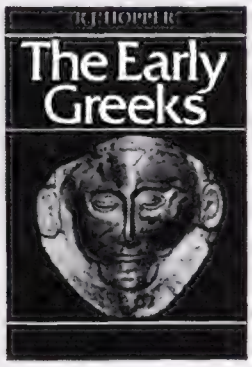

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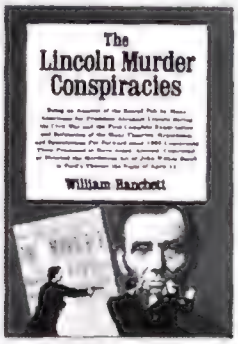

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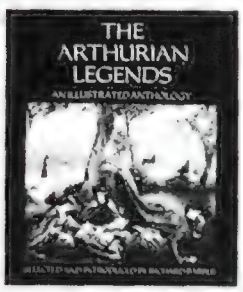

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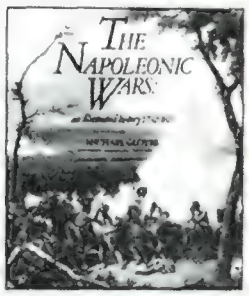

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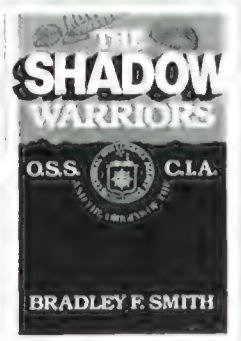

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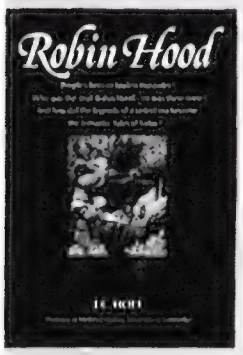

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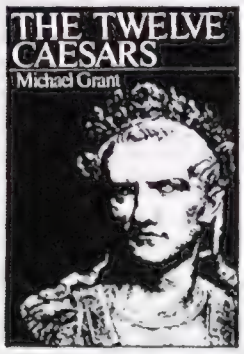

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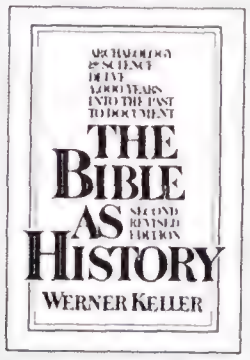

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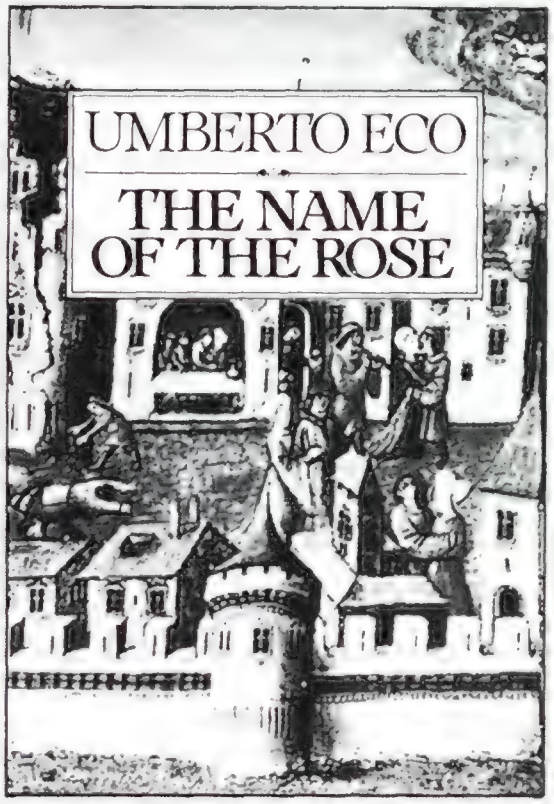

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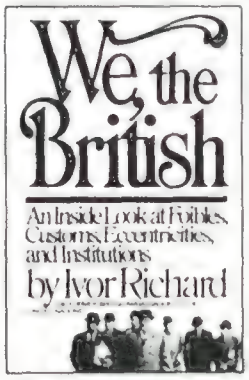

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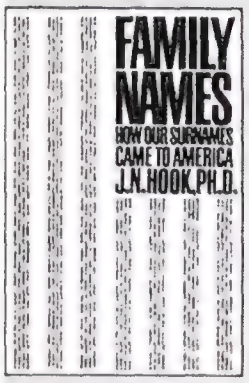

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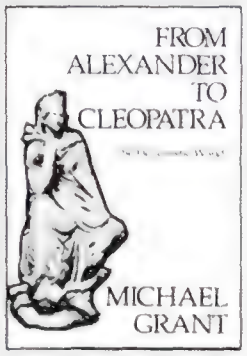

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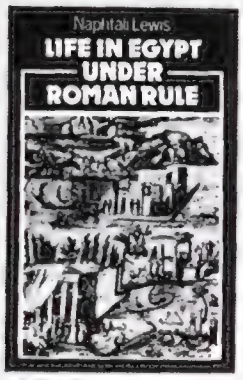

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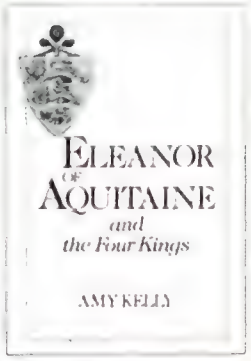

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Around the Mall and beyond

No one told me that ordinary, non-Himalayan India could be so *cold*. I am sitting on my bed (more or less in a Yogi position), scratching notes on a pad while wrapped in a blanket. It is only seven in the evening—I haven't had dinner yet—but the temperature has already dwindled down to the breath-seeing point in this unheated room and will touch three degrees tonight. That's three Celsius. I don't know what it comes out to in the distant measurements of the United States, which must be almost the only nation in the world that hasn't gone metric. I do know that it's not much above freezing. In *India*, for Pete's sake! And no one thought to warn me.

My cold little room is in the lodge at the Keoladeo National Park, near Bharatpur in the northwestern Indian state of Rajasthan. The bird sanctuary is just about as far as one can get from our Mall in Washington, but it is the kind of place Smithsonian people care about, and since I was on a trip to India I thought that I should pay a visit. I arrived from Bombay, via Jaipur, yesterday evening, and realized then that the short-sleeved shirts I had brought from warm, muggy Bombay wouldn't do at all here. But it was late. I had supper in the dining room, warmed by many bodies. I lined up a guide named Denish for the morrow and hit the sack, glad of the blankets. It wasn't until six this morning, when I was awakened by a cup of hot tea (inutterably welcome), that I faced the probability of being perhaps the first person in history to freeze to death in this area that turns to an oven in summertime.

Denish had said to meet him at 6:30

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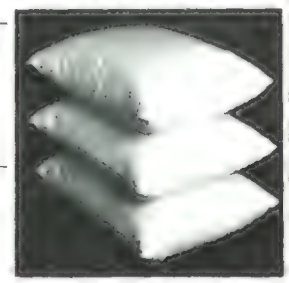

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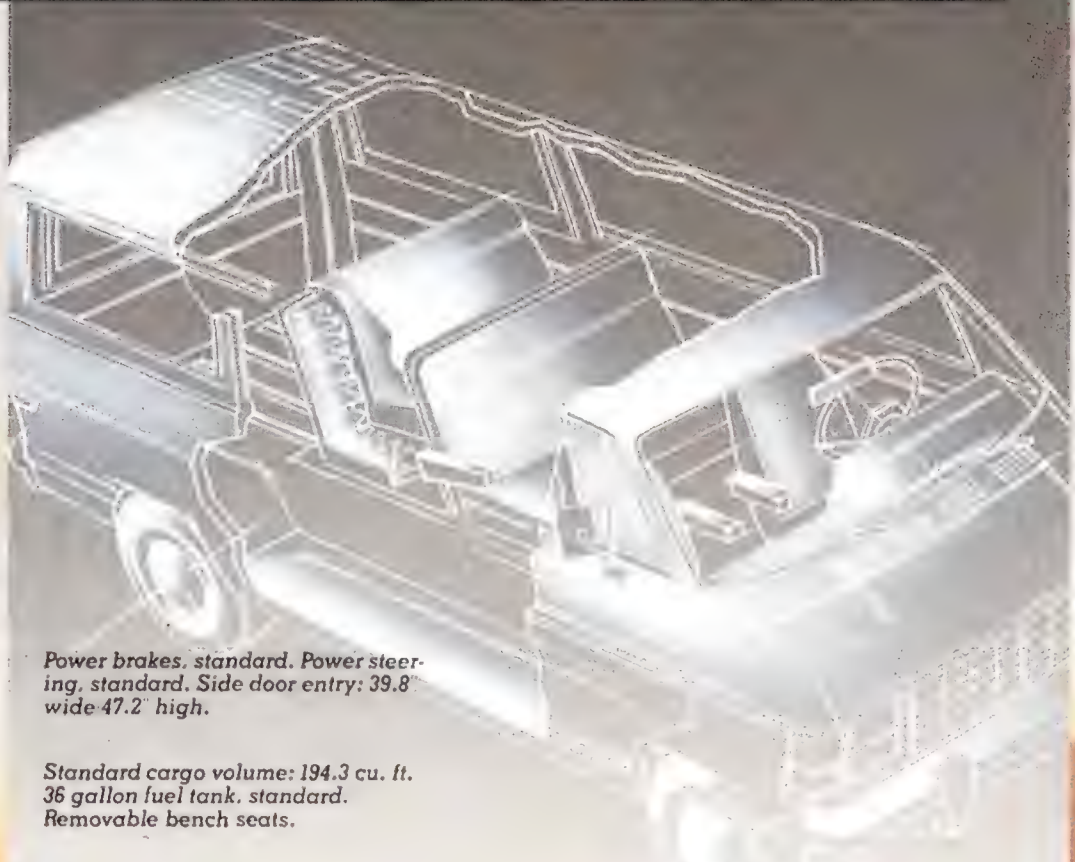

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A.M. in the lobby. We would take a boat out on one of the marshes that fill most of the acreage of this remarkable place, and we would watch the birdlife awakening and starting their daily toil: adults scrabbling for food to feed their awkward young—too big for the nest, too young to leave it. This required that we sit rather still in a boat—and that I turn gelid in the near-frost.

My stubborn survival instinct proved stronger than my desire to remain a conventional hotel guest. In order to keep living I snatched this wool blanket off the bed, wrapped myself in it like a Sioux warrior and joined Denish. And what a day we have had!

The water of the marshes was mist-wrapped and mirror-still as we slid out on it, poled by the boatman. I huddled on the forward thwart, watching the nesting trees materialize in the growing light. Now I could see the clumps of the nests and hear the first conversations—the complaints of the hungry young and their reluctant elders.

Soon Denish was able to identify the birds that almost seemed to bend the trees down to the surrounding water: painted storks, gray herons, spoonbills, white ibises, cormorants, snakebirds . . . As the sun rose, parents flapped off to go fishing in their various ways—spearing, spooning, diving. The young perched like lumps on the branches, then croaked in a frenzy of greed as a fish-stuffed adult flapped in for a landing.

As a 100-percent human being, I find the feeding process of some water birds reasonably disgusting. But I must say that watching the youngsters squabbling and shoving for their regurgitated meals was enough to make me forget the cold. By the time we reached shore, I had unwrapped myself. We paused to watch flights of comb ducks and graylag geese whistle overhead, and then I saw a line of sarus cranes, gray with red skin on their upper necks and heads, catching the low sun as they flew past, their long legs trailing astern. Cranes are pretty exotic to an American. These, gleaming in that early light, were unforgettable.

"Very good," said Denish, who had obviously arranged the displays. "Now a good breakfast, then we walk around the near part of the sanctuary, right *here*"—he showed me on his map—"and after lunch we take bicycles around the marshes, *there*."

Keoladeo Park was once the game preserve of the Maharajah of Bharatpur. Here he would invite scores of important guests who would blast away at whatever the beaters produced for them. A large plaque beside a trail indicates that over the years thousands of waterfowl fell before the guns of the aristocracy. On the 12th of November, 1938, the kill for a few hours' shooting came to more than 4,000 birds. Thanks to India's great conservationist, Dr. Sálim Ali (SMITHSONIAN, October 1976), the preserve became a renowned sanctuary, the wintering place for the rare Siberian crane, although we didn't see any of these.

Denish and I set out on our walking tour by simply following the black-topped road that is used by busloads of day tourists. Within a quarter of a mile he had pointed out a dozen species of everyday

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Indian birds: hoopoes, bee-eaters, parakeets, shrikes, bulbuls, babblers, many others strange to me but prosaic to Denish.

He guided my binoculars to the various targets with a mixture of impatience at my grade-school level of ornithology and a bemused tolerance of my ineptness. Being a professional guide, he also wanted me to chalk up a large count. "Scarlet minivet!" he would exclaim in high excitement. "Right in the top of that . . . no, *there* . . . you have the wrong tree! Now? You have seen it? Yes? No? But higher up! You see that big branch? Then the other big branch crossing behind it? There? That red bird! So small! But you have seen it? You have seen a scarlet minivet! Very good!"

The fact was—and I hope Denish doesn't read this—I never *did* see the damned scarlet minivet. I wish I had because my Indian bird book says "It is difficult to imagine a more entrancing sight. . . ." I'm always missing out on entrancing sights back home, so why not in India?

I was better at stuff on the ground. Denish led me off the road and onto a dusty path through scrub growth. The rains were well over in this part of the subcontinent, and though the heat was still weeks away and the growth was still fresh and green, the soil was topped by an inch of dust as fine as talcum powder. We moved carefully toward a small knoll where bushes grew around deep, wide-mouthed holes, each looking rather like a fox's den.

"What made these?" I asked.

"Rock python," Denish answered. "Walk softly. He doesn't hear, but he can *feel*."

I found it difficult to believe that I was close to a fabled python in the wild, but I walked softly and looked carefully. Just as Denish drew in his breath and pointed, I too saw the smooth, patterned back of a great snake, perhaps 20 feet long, looped carelessly under the bushes, rather the way a halyard lies on a cluttered deck before it is made up neatly on its cleat. Then the monster "felt" us; the long loops shifted and blurred and the long shape slid endlessly into one of the holes.

Not far away, my mentor again stopped suddenly and pointed wordlessly, and I, presuming a new bird was in sight, looked for one and was almost shocked to see three large red canines trotting away before us. They looked almost like German shepherds, but not quite. "Jackals," Denish announced.

The "lakes" of Keoladeo were made when the maharajah dammed rivers and built canals and sluice gates to control the flow from one paddy to the next. Dikes separate the flooded reaches where native water birds breed by the thousands and migrants visit in even greater numbers. We cycled here this afternoon, bouncing over patches of stone.

We found ourselves sighting eagles. India has several species, and even I had little trouble spotting them—huge shapes perched high in trees beside the water. They were very shy. Even Denish, who moved like a Gurkha jungle fighter, could get no closer than about 70 yards before his target would lazily unfold enormous wings and flap away. But he was mightily pleased at the sightings. "It is the Amer-

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ican bird," he said. "That is why you are seeing so many."

But my favorite of the lot was the tiny common kingfisher. India has many varieties, including the pied, which is black and white; the white breasted, which has bright blue patches on the wings; and the common, much smaller than the other two, but a brilliant little bird. Denish kept pausing by quiet canals beside the marshes, not telling me what he was looking for. Then, proudly, he pointed to a stake protruding from the water with this glittering little jewel perched upon it—iridescent blue-green wings, orange breast, a beak about as long as all the rest of it. "I knew you would like it," said Denish. I liked it, all right. He can keep his scarlet minivet.

It has been a long day, and I am ready for a hot curry. I'm also anxious to see people, for despite Denish's good company, the day has been rather lonely. How strange to feel this way in a nation of some 700 million people. I'm almost looking forward to getting back to Bombay with its crowds and clamor. Almost, but not quite.

Edwards Park

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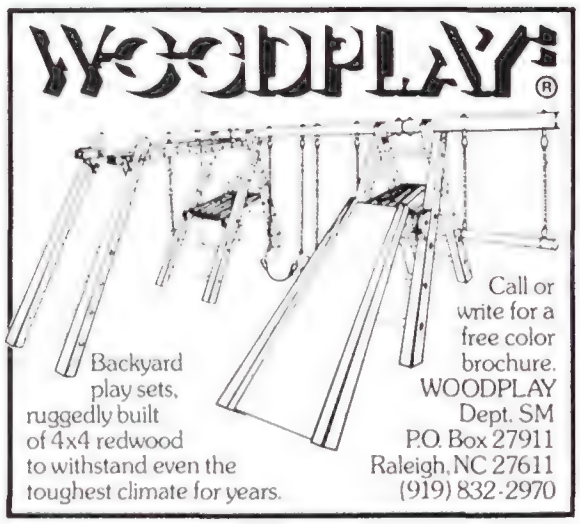
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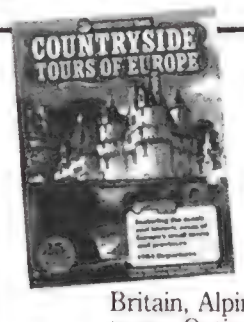

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Walter M. Bortz II, M.D.:

ON DISEASE . . . AGING . . . AND DISUSE

Much of illness . . . and even many biologic changes thought due to aging . . . may really be due to simple disuse

PUBLISHER'S NOTE: *Dr. Walter M. Bortz II of Stanford University School of Medicine and the Palo Alto Medical Clinic, in many medical journal reports, is urging physicians to recognize the striking evidence: That human frailty has a third dimension which is neither disease nor time. And that overcoming the disuse dimension by natural means can sustain health and slow aging-related changes as no drug can. We have asked him to brief you on this vital subject.*

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Medicine and the individual today are—or should be—faced with a potentially greatly rewarding new challenge: recognizing how much of all illness and slowing down result from disuse rather than disease or aging. And, of course, *the coronary challenge: how much can be done by something inherent, natural—becoming active, fully, purposefully active.*

The "disease theory"—not enough

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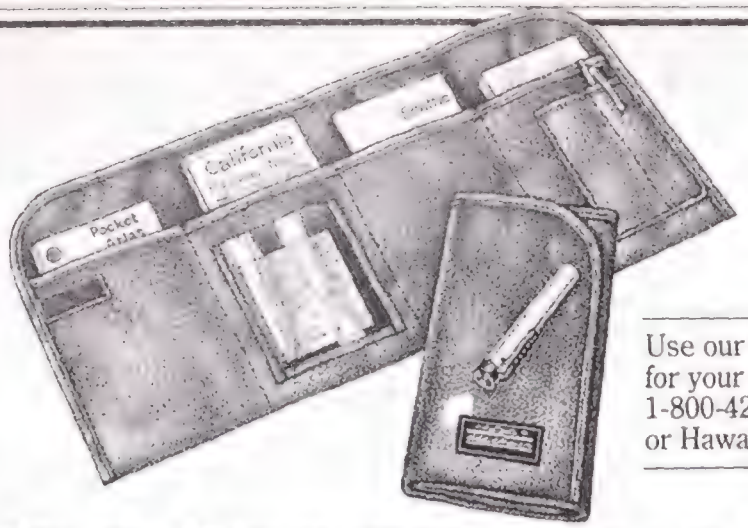

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Phenomena, comment and notes

With a little help from their friends, wild creatures flock to minihabitats in the midst of busy downtown streets

It always surprises me to walk into a brand-new restaurant and find it packed. Presumably all those people had managed to eat the day before. But there is a kind of life pressure that rushes into any new opening, fills any new space, like water pouring over uneven terrain.

People produce the most tangible life pressure. Roads, houses, shopping centers, factories spill over natural habitats like an onrushing tide. Humans push the wild into smaller and smaller spaces, leaving only the occasional pocket as park or refuge. One envisions wildlife confined to islands in a sea of human development.

But this dominant, human pressure is not the only life force rushing in to fill openings. Lots of traffic moves the other way. The wild is all around us, and pushes in on us whenever and wherever it can. The wild is searching, circling, watching, waiting for a new opening even more intently than city dwellers look for new restaurants.

Like many a city dweller, I tend to head for those parks and refuges when I want a taste of the wild. But all I really have to do is raise my eyes. There have been summer evenings when I dragged home from a day in the marsh, only to find more action in the skies above the city rooftops than I had seen all day. The nighthawks had come out and were swooping through the dusky light after the insects I could not see. And there was a morning in a quintessentially urban environment, standing on a subway plat-

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Pictured: Suit by Bill Blass. Dress by Norma Kamali.

form (at an above-ground station) in a crowd of commuters. I looked up from my paper to see what the hammering was and saw a pileated woodpecker, as big as a crow, all pterodactylous black triangles, red crest flashing as it worked an old tree in back of a caterer's establishment.

The wild sneaks in every time we blink. I walk down a wide concrete sidewalk between an eight-lane avenue and a row of concrete-and-glass government buildings. There is a government gardener, meticulously pouring poison into the expansion joints in the sidewalk, trying to kill the grasses that have taken root there. She may win the battle, but she will never win the war.

This life pressure can be seen best by deliberately creating new openings. A happy band of subversives in the National Park Service (NPS) has been doing just that here in Washington, with extraordinary results. They have taken a couple of architect's reflecting pools and converted them from algae-ridden trash pits to living ecosystems.

It all started in Bolivar Park, one of those little triangles that grace the city. The central feature is a concrete reflecting pool, set squarely in front of the Department of the Interior building across the street. As John Hoke of NPS relates the tale, the question arose as to whether there should not be a little life in a pond in front of the building that is headquarters for both the Park Service and the Fish and Wildlife Service. The pond already cost money to manage: it had to be drained several times a year to get rid of algae and litter on the bottom.

After an extended discussion of the esthetics involved, Hoke and his colleagues—in the NPS Division of Resource Management and Visitor Protection and in the Ecological Services Lab—got the go-ahead. They planted cattails and water irises in boxes of swamp soil just under the water surface. They introduced enough floating vegetation to cover about a third of the pond. They put in a large log and then turtles to climb out and bask on it. And best of all, they built an island, no more than six feet across.

A postage-stamp island in a concrete pool next to a busy intersection in a fair-size city would not have appeared very

Ducks have taken over what was once a reflecting pool in downtown Washington.

They breed each year on the tiny island, to the delight of nearby office workers.

promising to me, but then perhaps my own life pressure is a little sluggish. Ducks had flown far enough into the city to spot the island, and then quickly made it their own. Every year one or more broods of ducklings are hatched there, feeding on the aquatic vegetation (and some judiciously spread trout meal) until they are ready to travel.

In the spring, office workers from Interior come out at lunchtime to watch drakes battle for breeding rights while resident hens band together to keep interloping hens out of the pool. The crowds of people are heavy enough so that the Park Service has had to replace the original lawn around the pool with a tougher fescue and downgrade its maintenance standards. And yet hardly any trash is thrown into the water anymore.

The same magic has been worked in the seven-acre pond in Constitution Gardens along the Mall. Designed and built strictly as a formal reflecting surface, the lake was seeded with submerged vegetation in underwater planters; the one tiny, wild island was immediately commandeered by breeding ducks.

Along the way Hoke and his colleagues have found a secret ingredient that keeps their ponds in balance. They were still having trouble with algae, even after they resorted to an inert black dye that darkened the water enough to slow algal growth. So last July, when a particularly noxious bloom occurred, the Park Service took a pumper truck (the kind used to empty out septic tanks) to Kenilworth Aquatic Gardens, loaded up 500 gallons of bottom muck and inoculated Bolivar Pond with it, much like adding sourdough starter mix to a batch of pancake batter. In weeks, algal growth stopped.

The same miracle muck has been added to the lake in Constitution Gardens and the Reflecting Pool that lies between the Lincoln Memorial and Washington Monument, with the same happy results. The accountants are happy, too. Where it had cost $2,000 to drain Bolivar Pond to get rid of the algae (sometimes that had to be done four times a season), it had cost $20,000 to drain the Reflecting Pool.

Hoke and his colleagues have a history of working with nature instead of trying to overcome it. Years ago, when a cluster

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of "temporary" Navy buildings were removed from the Mall, some Park Service managers were dismayed to find a low, soggy wet area that quickly became a depository for beverage cans and windblown newspapers—and a breeding ground for mosquitoes. It made no sense to install expensive drains, for the area was to be torn up again for the creation of Constitution Gardens.

So they went the other way. The area was trying to be a wetland: they would help it along. They scooped out a hole deep enough for fish life. Next they raided a natural swamp for cattails and water irises, water lettuce and duckweed, mosquito fish and bullfrogs. Dragonflies and water striders arrived on their own as did, naturally, flotillas of wild ducks. For the price of a few hours work with a backhoe and one truck trip to a swamp, they turned a seep into a flourishing wetland that quickly became popular with noontime picnickers. That pond and swamp are long gone, but the philosophy behind them is still very much alive.

At the entrance to the Park Service's National Capital Region headquarters on Hains Point is a concrete pond where experimenters can try out new combinations of plants and pond organisms. Bass and bluegills live there, and it is not unknown for a Park Service worker to step outside with a fly rod, let out some line in a few false casts and drop a tempting tidbit next to a lily pad.

Bouncing along the Mall in his electric cart, John Hoke laughs with pleasure at how fast life moves into every new space he manages to create. He wants to know more about why what he does works so well. He hopes that somewhere a graduate student will take on the mission of finding out exactly which herbivores and decomposers in that pond muck—which microorganisms, aquatic worms and insect larvae—play the key roles.

He thinks about other wild creatures that circle our city islands, always looking for a new opening. Not long ago he was in London, trading information with the people who manage the Serpentine Lake in Hyde Park. As many as 50 species of unusual waterfowl are seen there in a year, he was told. And it is not clear to him why we cannot do better here. If John Hoke has his way, there will be a lot more traffic coming the other way.

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It isn't fair, his mother thought, he's still a baby! The curls were so sweet. Now he looks like a little stranger with his ears sticking out like that. And there's the back of his neck, so defenseless. She must remember to keep one of his curls, maybe tie it up with a ribbon and put it in the family album.

"Well, I'll be darned, the boy actually has a forehead!" said the father, and laughed.

The boy didn't know why it was funny, but he laughed too.

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Jacob, a "language disabled" six-year-old, starts out typing on talking word processor in first session with Laura Meyers. Computer says whatever he types.

Jacob laughs as the computer repeats his message, then he throws up his arms in gesture of triumph (opposite).

By Paul Trachtman

Putting computers into the hands of children without language

Giving handicapped youngsters control over an electronic voice is helping to unlock their own abilities to speak, read and write

The children on the grassy playground of a school in Torrance, California, are not ordinary. The chubby blond toddler climbing a three-foot ladder and plunging down the shallow slide picks herself up with a daredevil grin. The tricycle rider rampaging around the perimeter is propelled by a glee that seems inexhaustible. A small girl who is learning to walk, defying muscle spasms that interrupt every movement, gestures uncertainly toward the slide. Suddenly she points straight at it and says "That!" with a smile that lights up her whole being and that guides her quickened steps toward the goal. It is when the joy of life emerges in these children, and they find expression for it, that meaning seems most present in their lives.

What they share is a label, "exceptional children," a name for many conditions and situations that make their existence difficult, even precarious. They may be diagnosed as physically handicapped, emotionally disturbed, mentally retarded or learning disabled. Often they look out at a world that cannot make sense of their attempts to communicate. And at such moments, if you look into their eyes, their expressions are blank. It is hard to tell if anyone is there.

This morning, in a room off the playground, Dr. Laura Meyers is setting up a computer. A specialist in child language development with a PhD in linguistics, she has been doing research on how computers can help children begin to speak. A shy youngster named Mary appears at the door and is nudged gently forward by

Photographs by Enrico Ferorelli

Buzzy, five, normal learner, uses ASU computer with handicapped children; Mom, Rosegrant (right) watch.

her mother. A teacher greets the child. "Good morning, Mary," she says. Mary murmurs a greeting and looks intently at the teacher. "Who else is here, Mary?" her mother asks, meaning Meyers. Mary points at the computer and everyone laughs.

The classroom is part of the Infant Program at the Exceptional Children's Foundation, based in Los Angeles, which seeks to provide therapy and education that will help even the most severely handicapped children develop their "full individual potential." At the root of such potential is language, whether it be spoken or written, signed by hand or expressed by some other means. For children who can't express themselves in any form of language, Meyers' computer provides a new way of speaking.

Some of the children don't have the physical control to form words with their mouths; others haven't caught on to the secret of language, the association of sound with meaning. But when one of them touches a picture on a pressure-sensitive panel and the computer, in a low-pitched electronic voice, names the object in the picture, the child suddenly becomes alert. Meyers responds by giving the child a toy he has named, or an answer that shows she understands what the child means to say. "They understand immediately," Meyers says, "that the computer is giving them control over their own meaning." When she was developing this system several years ago, many children who began to speak through the computer's voice rapidly started speaking themselves.

One of her unexpected successes is Tommy, a two-and-a-half-year-old with Down's syndrome. "He used to sit in the classroom like a little lump, just slumped over and staring vacantly," she recalls. The loose muscle tone and floppy posture often associated with Down's syndrome made it hard for Tommy to form words. "With a speech synthesizer, he was absolutely delighted that he could generate his own words," Meyers says. "In the first session he said 25 new words. In the year before, he had learned to speak five words. After a couple of sessions at the computer, he went back to his classroom and stood in the middle of the room yelling at the top of his lungs until everyone in the classroom turned around and looked at him, and then he waved with a great big grin, said 'Hi,' and sat down and started playing with another child." After that, Tommy grew alert with people; at age three he moved into a regular classroom.

A talking computer in Phoenix, used by children who already know how to talk back, but who are having trouble with reading and writing, is producing similarly dramatic results. Dr. Teresa Rosegrant, a developmentalist with a PhD in early childhood education and linguistics, designed her word-processing system for these children (and any beginners) so that the computer can say each letter, word and sentence a child types. The child chooses what it is to say.

At Roadrunner Elementary School, Rosegrant steps into Pam Clark's writing lab and finds a second-grader bent like Rodin's *Thinker* over a computer. "Hi Mark.What have you been up to?" she asks."I slept in my sister's crib for two nights," he says. "Why did you do that?" Rosegrant asks. "She wanted to sleep in my bed so I slept in her crib, because we wanted to go forward and backward in time, so she got older and slept in my bed and I got younger and slept in her crib."

Mark begins to type his story on the word processor: "MY SISTER'S CRIB. The matrs was soft." He instructs the computer to read his words for him and laughs at the synthesized speech. "I have a hoarse voice," he says. Mark is not going to produce a literary masterpiece today, but he is developing precursors of literacy not always acquired in school—attention, motivation, interest and attitude. "Children as bright as Mark have been taught so well how disabled they are, it's painful," Rosegrant observes. "As a first-grader he told me, 'I'm a nonreader.' I said, 'No you're not, you're learning to read.' But he insisted, 'I'm a nonreader. I'll probably never read.' "

When Mark looks at the screen, it's as if he never reads the same word twice. But hearing the computer say the words helps him to make sense out of written language. "One thing I've learned in the past few years," Rosegrant says, "is *never* think that what you're seeing now is what you'll get."

Paul Trachtman is on SMITHSONIAN*'s Board of Editors.*

One of the children who taught her that was a second-grader at Roadrunner. A skinny, frustrated mischief-maker who could barely read and write, he was in danger of being held back. "No one knew what to do with Kevin," Rosegrant says. "When I met him, I found he was incredibly interested in machines, so the first day he came in we opened the computer lid and talked about interface cards and how impulses went to the printer.

"It was pretty tough for him to use the keyboard," Rosegrant recalls. "It was hard for him to coordinate what his hand was doing with his eyes, and to scan the lines of print. But we started talking about dirt bikes, which he just loved. I told him I thought other kids would be interested in what he knew about dirt bikes.

"The next session Kevin came in with his title 'All About Dirt Bikes,' and started writing: 'There are many ways that you can start a dirt bike. You can turn on the key, kick the peg, or hotwire it. Dirt bikes come in many sizes. They have many chain lengths. Some chains are 23 inches long and some chains are 48 inches long.' It was his first story on the word processor. It grew to eight sentences, and took him five days. Hearing what he typed helped him stay with it."

When it was printed, Kevin carried the story away with delight, only to return three days later looking exasperated. "When you write books, you don't put the whole thing on one page," he griped. "I can't make a book out of this one page!" Rosegrant sat him down at the computer. "I'll show you the next level of word processing," she explained. "You decide what is page one and I'll show you how to move the rest down to page two." Kevin was awed. He figured out where to break up the story, printed three pages and left happy.

Five minutes later he came back. "The title should be on its own page," he said. The chastised educator watched her budding author create a title page.

As his motor coordination and confidence improved, Kevin started teaching other second-graders how to use the word processor. But he doesn't get to use it himself any more. Now in third grade, he is no longer regarded as learning disabled.

The leap into speech and literacy which Laura Meyers and Terry Rosegrant have seen in more than 100 children is only a beginning. Most children do not become proficient in only a few sessions, and many may continue to have some difficulties with language. But watching these youngsters become capable speakers, readers and writers has radically changed the two researchers' views of handicapped children and how to help them. Meyers and Rosegrant have become collaborators as their work has led them to doubt and then challenge most of the basic assumptions underlying established programs for children without language.

In 1980, Terry Rosegrant was teaching child development and language courses at Arizona State Univer-

Chris, six, rereading printout of his story at ASU lab, benefits from combination of screen, voice and print.

Roadrunner student Andrew, eight, grins with glee as he listens over headphones to talking word processor.

sity, where she is an assistant professor in the School of Education. She was doing academic research on how people try to teach language to quadriplegic, non-oral children. Her interest became less purely academic, she says, when a mother brought her two-and-a-half-year-old to her office. The girl had little control of her arms and legs, and no speech.

"The mother assumed I would want to test the child," Rosegrant recalls. "And I said, 'Gosh, I wouldn't know how to test her. But what can she do?' I got a blank look. She was ready to tell me everything the child couldn't do. I asked her 'What does she like to eat? What does she think is funny? What kind of games does she play?' And then the mom started pouring out information."

Building on what children can do

Rosegrant's attempts to find a school program that would build on what the child *could* do met with more blank looks. "The prevailing view among professionals is that it's more scientific to spend time on testing and evaluation," she says. "You find out what the children can't do and try to teach them to do that—which by definition may be the hardest for them to do." A little later, Rosegrant started making calls all around the country to ask if anyone was using computers for children with language problems. Someone told her to call Laura Meyers at UCLA.

Meyers had been searching for a system that would give young children who could not talk a means to begin communicating, and had concluded that there was nothing available. So she decided to invent something, although she hardly knew how to start. At the time, she was working with Dr. Arthur Parmelee, chief of the Division of Child Development, in UCLA's Department of Pediatrics. He had assigned her to be the language consultant to the toddler classroom of the UCLA Intervention Program.

There she met Ricky. "It seemed he was not going to begin speaking or be able to use sign language any time within the near future," she recalls. He was two years old and the most severely physically handicapped child she had ever encountered. Cerebral palsy left him with little control of his limbs. He was prone to seizures that stopped his breathing, couldn't hold his head up and had to wear a helmet to protect himself. It was hard to tell what he could see.

Yet Ricky is a child who has come to play with the world, whose attempts to communicate make you want to know him. If you find him at play, the joy of life that is in his eyes can take your breath away.

"I asked the teachers and therapists what they usually do to help a child like him," Meyers says. "They said there were communication devices on the mar-

Mike, a two-year-old with Down's syndrome, gets toy helicopter he has just asked for on Meyers' computer.

Sylvia, two, fights cerebral palsy to control a computer that speaks Spanish, asking for "more" ("*mas*").

ket—systems with rows of squares that light up when you move a switch, or that speak when you press down on one of the squares—but they were made for older children and adults, not toddlers. So they had plans to address his other needs—teach him how to swallow and how to crawl—but there were no good means to help him communicate. I went back to my office and threw books at the wall, I was so outraged."

Meyers borrowed a speech synthesizer and showed it to Ricky. "I had to help him position his hands and help him push the squares, but after ten minutes, when I tried to take it away, he wrapped his body around it so tight that we had to physically, with great force, peel him off. I had to keep saying, 'We're going to get you one.' "

That was when she started talking to people about computers. She evaluated all the available communication devices; none was easy enough for Ricky, but in the meantime he began learning some sign language to tell Meyers what he wanted a device to say. The system Meyers ultimately designed, called Programs for Early Acquisition of Language (PEAL), has a flat, touch-sensitive membrane board with large squares for pictures, symbols and words, connected to an Apple II computer and an Echo II speech synthesizer. Several volunteer programmers, including Jim Day and Arthur Villano from the Xerox Corporation, have helped her develop the program. Plastic overlays allow her to change pictures over the squares and, with the computer, she can quickly change what the system displays and says.

"Graphics may be fun, but speech is speech"

With a prototype ready, Meyers then carried out a research study designed to see whether children would be more responsive when they controlled either the graphics or the speech. Toys were propped atop the computer, and when a child touched a square and the screen showed its image—or the synthesizer named the toy—the child got the object to play with. "My hypothesis was that two-year-olds would prefer speech because it's developmentally meaningful—they're trying to learn to talk. Graphics may be fun and games, but speech is speech."

One child in the study was Suzie, a cherubic 22-month-old who had no control of movement above the waist and couldn't hold her head up. The closest she had come to speaking was an audible "Kay," which her parents understood as "Okay." Her mother said she could understand only six words. "I knew that had to be wrong," Meyers said. "She was observing the whole world, so I knew she understood more than that."

The system was set up so that Suzie could touch the squares with her feet. First she played with the graph-

In Meyers' Santa Monica apartment, programmer Jim Day and artist Terence Lawlor work on Sunday.

ics. "It was so motivating for her to control anything," Meyers recalls, "that I thought she would not prefer one over the other. But the first time we tried the speech, she touched one square with her foot and it generated speech and she immediately gestured to us with her hands. I said, 'Oh, you want to use your hands?' And she nodded Yes.

"She had never done anything with her hands before, but she touched the square for 'helicopter' five times. She immediately started making sounds, and I guessed what she was saying; the occupational therapist who was propping her up was saying, 'Oh, no, come on, she can't say words like that.' And then she touched 'helicopter' three more times with her hand and said 'Elicopter.' "

Within a few minutes, Suzie also said "Car" and "Wind," after using the computer's voice to ask for the car, and to ask Meyers to wind it up. There was also a sign language symbol for "get" on the board. The therapist pointed it out to Suzie and said, "Tell Laura get." Suzie did not press the square. She just turned to Meyers and said "Get." At the session's end, the therapist said to Suzie, "Why don't you just tell Laura, 'I don't need the computer, I can talk.' "

By this time Terry Rosegrant had come to Los Angeles to join Meyers and UCLA research psychologist Leila Beckwith in the search for explanations. They found themselves weaving together strands of linguistic theory, developmental psychology and research on social interaction, drawing from each field ideas that threw light on the meaning of "meaning."

"All of a sudden they think, 'I can' "

"I think meaning has to involve more than one person, and these children are always left out of the dialog," Meyers says. "We've found in children as young as 20 months that they already think they've failed. They already know they're not talking. They already know that people are disappointed in them.

"What we can do," she says, "is immediately give them the ability to talk through the computer. And what happens in many cases is that they start talking with their mouths. At first they thought, 'I'm a failure, I can't talk.' And all of a sudden they think, 'I can.' And the words just start to come out."

More important than the computer, Rosegrant and Meyers believe, is the context in which it is used. As theorists, they believe that language springs essentially untaught from a child's sense of being able to take part in a dialog. "We know that language is so complex that it would take a million years to teach a child to talk or to write," Meyers says. "What you have to do is make the child into someone who is learning because that's what the child wants to do."

Meyers returns to beach-front apartment carrying computer system that she transports daily to classes of the Exceptional Children's Foundation. Equipment was donated to her by parents of handicapped child.

Many linguists take the narrower view that children acquire language primarily by focusing on rules of grammar. This view leads to teaching methods that stress accuracy before meaning. "Too often the schools don't teach reading and writing," Rosegrant says, "they teach subskills. They teach handwriting, spelling, grammar, punctuation." For children who have trouble controlling their bodies or focusing their minds to begin with, this approach may be the greatest hurdle to their ever achieving literacy.

When Meyers' toddlers turned three, she was ready to give them computers with talking keyboards as a tool to develop literacy. Watching these children, Rosegrant began to suspect that many older children who couldn't read or write might be handicapped more by conventional instruction than by nature.

She had a chance to test her hypothesis at the New School for Child Development in Los Angeles, using a precursor of the talking word processors she and Meyers have since developed. She asked the school to pick ten children who had proved the most difficult to teach to read and write. "Not only were the children not literate," she recalls, "but some of them had learned the wrong names for the letters of the alphabet."

Alice was 14, diagnosed as retarded and emotionally handicapped. "She had a tentative way of walking," Rosegrant recalls, "as if she hadn't used her body much. She always hung her head, and I couldn't get any eye contact. She could not even spell her name."

With Rosegrant's help, Alice typed her name, listening to the computer say it. The next time, she started writing about what she liked, but not using the "I" pronoun. She would write "Alice likes ice cream" and have the computer say it again and again. Then she would have the printer fill a page with that one sentence and she'd read it to her teachers.

She went on like that for about eight half-hour sessions, writing new sentences like "Alice is smart" and "Alice has friends in school." She used the computer to keep repeating them. At this point, the children had begun to read each other's writing. One of them had written that he liked the *Dukes of Hazzard* on television. Alice saw it and wrote: "Gary likes the Dukes. Alice likes the Dukes."

"She sat back and she looked at that," Rosegrant recalls. "She was smiling and said, 'I want to read that.' She made the computer say it again and I read it for her. And she sat and thought for a minute and then she sat upright and started chanting 'Gary likes the Dukes. Alice likes the Dukes' over and over. I said, 'You didn't realize that you liked things that other people like, did you?' She shook her head No. Then she moved to the 'we' pronoun. She started writing 'We had tacos in class. We like to eat them. We had fun.'

"By then she would come skipping down the hall to see me, really chatty, telling me everything she was doing in class. In our sessions she was reading a lot more vocabulary than I thought she could, and when she wrote she would tell me, 'I can spell that, you don't have to write it out.' Her sight vocabulary at the end of eight weeks was 400 words."

Rosegrant headed back to Phoenix and began working with Intel Corporation programmer Russell Cooper, who volunteered to help develop her Talking Screen Textwriter program, and she set up her own writing lab at ASU. Meyers left UCLA when her work with the toddlers was halted for lack of funds, although children were searching her out, demanding

a turn at the computer. She moved across town, to work with Dr. June Shoup at the University of Southern California's Department of Communication Arts and Sciences, and began her research with infants at the Exceptional Children's Foundation.

In the past year, Meyers and Rosegrant have both continued getting results and have become clearer in their understanding of what is going on. "The child has intrinsic motivation," Meyers says. "And if we provide an appropriate tool, the child will use it."

Rosegrant agrees. "Too often literacy is not even a goal in school. We've both been told that we're creating 'gifted handicapped' children, which makes it harder to keep them occupied with learning daily living skills. As if reading and writing wouldn't be important daily living skills for them. People will tell me, 'Well, she only has the IQ of a five-year-old.' Do you know how much a five-year-old can do in the world? Five-year-olds used to help run textile industries. Five-year-olds can negotiate. They can read and write. They can be a pain in the butt. So if someone says to me that this person has a mental age of five, my first reaction is, 'My God, how wonderful that they're that far!' "

What children like Ricky or Alice are showing is that the prevailing theories about them are wrong. And many of the diagnoses, therapies and educational programs based on those theories may be contributing to the conditions they are meant to correct. Meyers' mentor, Dr. Parmelee, with a graying pediatrician's common sense, defines the problem clearly: "It is easy for parents and therapists to see what the child can't do, and of course that's what the parents are most concerned about. If you work only with the handicap, then the child focuses on his defect and doesn't see any clear evidence of being rewarded for the things he can do. But if we focus on what the child can do and work with that, then the child can find ways to work around the handicap."

Rosegrant and Meyers plan to distribute their software through small corporations that will support further research, a necessity in that they have not yet received support from any national science agencies or foundations, and have used their salaries to help pay for pilot studies. This is ironic, given the current emphasis on research into computer readiness and games. "The only way I can understand the term 'computer readiness,' "says Meyers, "is whether or not the professionals have a computer ready that the child can use."

The computer never tells a child what to do

In coming to understand their own success, Meyers and Rosegrant have gained some insight into why many computers currently used in classrooms and special programs for the handicapped do not produce the same results. "One way our software is different," Meyers explains, "is that nothing happens unless the child does something. The computer never asks the child anything, and the computer never tells the child what to do next. That's why you need a teacher or parent there. The computer is the child's tool, not his teacher." The two researchers do not see the computer as magic, and have no faith in the usual programs of "computer-aided instruction" or "motivating" games. Their faith is in the children.

They are also realists about how much the computer can help. In public education programs for the handicapped, there are more than three million children between three and 21 years of age who have been diagnosed as having language difficulties. Meyers' and Rosegrant's results raise new questions about what can be done to help them. But the researchers are careful not to raise false hopes.

"We're not curing anyone," Meyers points out. "The effects we see are limited. We value the fact that a child with Down's syndrome now has language and can write a story or a poem. That's important to his family and teachers and friends, but he still has Down's syndrome. I think many of the children we work with are going to live difficult lives."

The lives of the two researchers are not without frustrations. In Phoenix recently, as Mark was showing progress in reading and writing on Rosegrant's talking computer at the Roadrunner School, he was moved on to other programs. "It shows how specialists focus on aspects of disabilities instead of a whole child," Rosegrant says. "They took Mark off the computer and put him in four different programs, parceling him out to different people—one will drill him on words, one on his eye coordination, one on his motor skills and one will work on his frustration!"

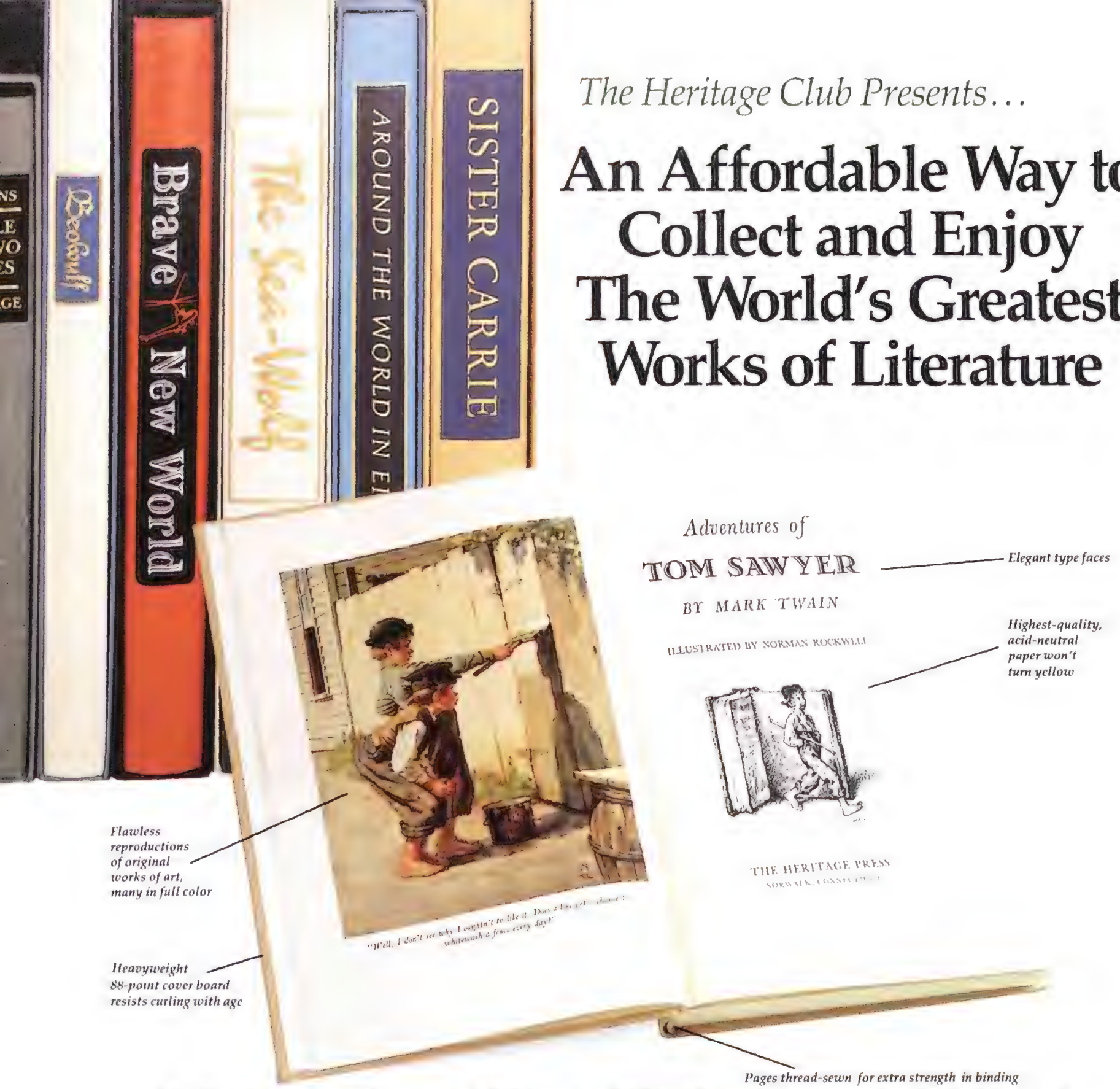
In Los Angeles, Meyers was asked to visit the McBride School, a public school with 250 handicapped children and a new computer no one yet knew how to use. "I'm so glad you're helping us out because we're totally lost and we need to know what's out there," the school's speech pathologist said. And the principal concurred, "Even if there are just one or two kids you can help, that's better than where we are now."

Despite the efforts of an outstanding principal, not all of the instruction Meyers found at McBride could be called effective. A girl in leg braces was bent over a pulp workbook page with a story about the ballet. She had been struggling to write her sentences: "I have been to the ballet" and "Watch me turn around." A teacher's aide was urging the child on: "Now make a strong statement about the ballet." And the girl slowly wrote, "I love the ballet."

"Have you been to the ballet?" Meyers asked. "No," the child answered, grinning as though she were used to dumb questions.

In the courtyard of the school, Meyers met Ricky again, for the first time since leaving UCLA. She bent down and he looked at her very hard, then flashed a smile. "He can speak," his aide said, standing behind his wheelchair. "The other morning I woke up and thought I heard something, but I couldn't believe it. It sounded like Ricky in the next room. Then I jumped out of bed and ran into his room. His wheelchair had fallen over on him and he was stuck. He was saying 'Help me!' "

Luke, third-grader at Roadrunner, shows off book he wrote on talking word processor, illustrated by hand.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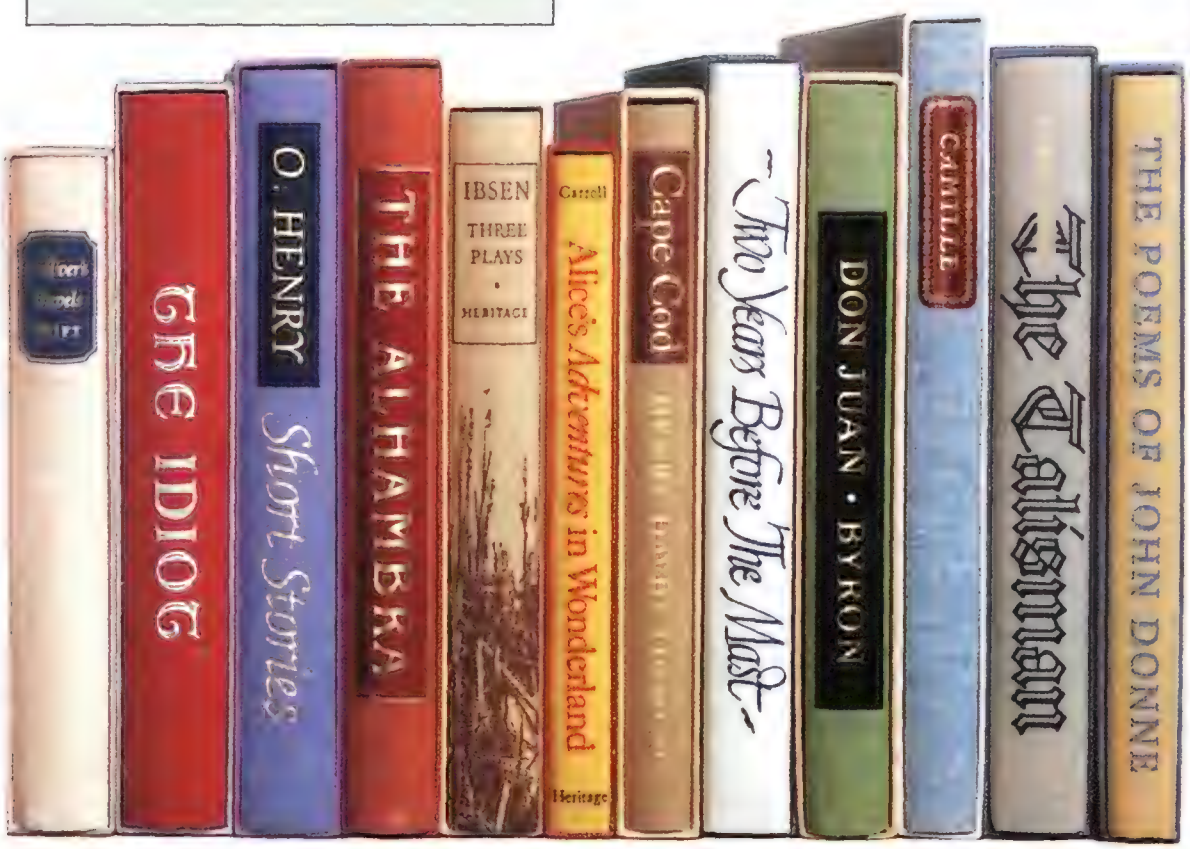

Louise Nevelson, sculptor, 1981

Willem de Kooning, painter, 1980

By Avis Berman

A bold and incisive way of portraying movers and shakers

With cutting insight and innovative style, Marisol, the 'Latin Garbo,' has captured the famous in powerful, rough-hewn images

Georgia O'Keeffe, painter, 1980

Martha Graham, dancer-choreographer, 1977

Georgia O'Keeffe locked glances with Louise Nevelson. The two of them seemed imported from some ancient myth, warring goddesses simultaneously majestic and peevish. Martha Graham's expression, as she stared straight ahead, was an echo of the terror-stricken creature of Munch's *The Scream*. Willem de Kooning, distraught and vulnerable, seemed to long for a soothing hand, whereas Virgil Thomson, stately and plump beside his piano, was a figure untroubled by torments. Picasso was there. And Marcel Duchamp.

The mandarins, sculptured portraits all, were gathered at the Sidney Janis Gallery on Manhattan's West 57th Street in the spring of 1981. They were the latest subjects of scrutiny by Marisol, the Venezuelan-American sculptor who did much to enliven the New York art scene just as it was turning Pop. The pieces on view were done in homage, but they were oddly unsettling paeans, too, studded with cautionary observations on the price paid for a seat in the cultural pantheon. The weather-beaten wood she used, lovingly blasted, scarred and chipped, was the ideal material for suggesting the contrast between emotional vitality and physical frailty of old age.

Not that Marisol, an acknowledged whiz at satire and whimsy, has grown solemn or unsmiling. Visitors to the gallery could hardly decide what to admire most —the tender carving, the variety of textures, the blend of poignancy and charm, the incisiveness of character

A photograph of a smiling Marisol was taken in New York in 1964 by photographer Hans Namuth.

unsparingly caught to the life, or the adroitness with which the artist invigorated the supposedly moribund tradition of portrait sculpture without skidding into hagiography or camp mannerism. Here was sculpture that made everyone want to come back for more. Yet few people could fail to notice that something had decidedly changed. Instead of offering sly generalized criticism of the rituals of American social and political life as she had before, Marisol focused on more pointedly personal ruminations in delineating beings she views as mentors and beacons.

Marisol says she was moved to sculpt her artists because they were the people she revered, and leaves it at that. But the questions of maturity, achievement and esteem, whether or not they were raised consciously, are not idle or extraneous to Marisol's preoccupations. For one thing, identity has long been a favorite theme of hers. For another, the 1981 show, in which she also exhibited a memorable interpretation of Leonardo's *The Virgin and Child with St. Anne*, took her five years to compile and was an event of some moment. It signaled a public reemergence after some fairly quiet years, in which she seemed to stand on the artistic sidelines. And, for this observer at least, the new series of portraits appeared when Marisol could find herself in the disorienting—or liberating—predicament not uncommon to artists who experience substantial success in their youth. Her early career, though not without its fluctuations and reversals, was a relatively straightforward trajectory of study, apprenticeship, invention, attention and fruition in a development in tune with the prevailing stylistic impulses of the time. Now, although she is creating some of her strongest, most self-willed images, her individual style no longer meshes with what is au courant, and the fashion inevitably moves on.

To see how she was resolving these and other practical problems of life, I paid a visit to Marisol not long ago. With her dark, shoulder-length hair barely touched with gray, her large, inquisitive eyes, her energetic stride, and her trim, hardy physique zipped into a white cotton jumpsuit, it is hard to believe that this woman is 53. Her severe, linear beauty has always caused heads to turn, but maturity has actually enhanced the distinction of her face. Marisol's conversation is not what you would call irrepressible, but neither is she, as has been alleged rather unfairly, "a sphinx without a riddle."

Marisol lives in a loft in lower Manhattan, in an industrial district close by the Hudson River not yet overrun by Post-Modernist restaurants and New Wave clothing stores. The central space is given over to a studio that looks like a carpentry shop. Against a long wall is a big work in progress—a *Last Supper*, once again inspired by Leonardo, like the one seen at the Janis Gallery in 1981. (The gallery will present a show of Marisol's most recent work, including the *Last Supper*, next May.)

Marisol Escobar was born in Paris on May 22, 1930, and raised there and in Caracas. Her parents were well-off Venezuelans who traveled and socialized extensively, and she and her brother, now an economist, were uprooted many times. When Marisol was 11 her mother died, and the little girl was placed in a succession of schools, eventually in Long Island and Los Angeles. According to a 1975 interview in *People* magazine, she was a confused teenager. She disapproved of the "wild parties" her parents threw, refused to talk because she "didn't want to sound the

New York-based writer and critic Avis Berman specializes in the visual arts. She wrote about painter Camille Pissarro in the issue of June 1981.

Minneapolis Institute of Arts

In Marisol's *The Party*, 1965-66, each of the figures is a portrait of the artist. Today she says, "Originally, using my face was like a search for the self. I don't have to do that anymore . . . I know I'll never find it."

way other people did," and had visions of becoming a saint, reminiscing, "I started walking on my knees until they bled, and I tied ropes around my waist until they really hurt." That phase lasted about two years, followed by expulsion from high school for being a "bad influence" on the other girls. Nonetheless Marisol discovered she was adept at drawing, kept at it, and confirmed her early desire to be a painter. Her father encouraged her in this and in 1949 she moved to Paris for a year's study at the Ecole des Beaux-Arts.

But Marisol preferred New York. She arrived in Manhattan in 1950 and has called it home ever since. After a brief, unsatisfactory stint at the Art Students League, she was advised by a classmate to transfer to Hans Hofmann's legendary school, where pupils learned to paint by dispensing with objects and conventional perspective and concentrating on the "push and pull" of plastic forces. Marisol was an attentive student, but as she later recognized, she could not think about art as an exercise in abstract form, and she did not progress much past imitating her teacher. However, Marisol adds, "Hans Hofmann taught you to be proud to be an artist, which was especially important in those days when most people thought that was a bad idea. It was important to feel that it was important to be an artist." Hofmann also told her about the Cedar Street Tavern (located on University Place), popularly known as the Cedar Bar, a noisy Greenwich Village hangout where the likes of Jackson Pollock, Willem de Kooning, Franz Kline and Philip Guston (then just emerging as major American painters) would sidle up to the bar for a beer and an evening of congenial, bibulous argument. Her glamour and nonconformity attracted de Kooning, who befriended her. "De Kooning was my hero—actually, he is still my hero —and I learned a lot from him," Marisol says.

The cutting images of Marisol

Museum of Modern Art, New York, gift of Mr. and Mrs. Lester Avnet

In 1967 Marisol began a series of portraits of world leaders, including LBJ (detail) with his family.

Even in a city at home with immigrants and outsiders, Marisol was an unusual presence who radiated elegance and unpredictability. A well-known episode in the Marisol annals is based on an appearance she made on an artists' panel in 1961. All the participants were dressed conventionally except Marisol, who sported a stark-white Japanese-style mask. As the evening wore on and the audience grew rowdier, hecklers yelled, "Take off your mask! Let's see your face!" Marisol carefully untied the strings. She had painted her face as an identical copy of the mask she wore. "What a stunt! . . . it brought down the house," reminisced Al Hansen in the *New York Times Magazine*. Her capacity for the unexpected has become well-known. "One evening Marisol called to tell me she was going off to do a little deep-sea diving," recalls her friend and fellow artist William Katz. "She came back a year and a half later, after a detour through Nepal, Tibet and Tahiti."

In 1954 things began crystallizing for Marisol, who was tired of brushing away at perfunctory abstract pictures and lounging around the Cedar Bar. She met the painter Alex Katz and sculptor William King, who shared an enthusiasm for the cunningly conceived toys, signs and utensils carved by American folk artists. In particular, Marisol came under the influence of King, who was experimenting with small painted figures and was technically well-versed in modeling, carving and joinery. A study of pre-Columbian artifacts, which she had first seen in 1951, completed her new education. Marisol jettisoned easels and canvases for wood and clay and took the human figure as the center of her art.

In 1957 Marisol emerged as a sculptor, participating in group shows on Tenth Street, then the site of gal-

National Museum of American Art, Smithsonian Institution

Portrait of Charles de Gaulle makes it clear why series of political portraits was known as a "hit list."

leries that served as incubators for the young avant-garde. She was gouging out frightening totemic figures and filling boxes originally meant for printer's type with what looked like votive figurines of terra-cotta. Her wit and invention impressed a collector-turned-dealer named Leo Castelli, who had just opened a gallery in his apartment. He offered her a one-woman show, and Marisol soloed there in November, several months before Castelli electrified art audiences by promoting the peculiar productions of two hitherto underground painters, Jasper Johns and Robert Rauschenberg. Marisol was greeted with positive reviews. She was on her way, it seemed.

Everything opens up in Rome

But the image of herself as a popular young comer frightened her. Filled with doubt, Marisol fled to Italy and stayed away for a year. Explaining that difficult interlude, she says: "The beginning of my real development, in my late 20s, started after I spent a year in Rome. There I stayed alone, trying to rid myself of the feeling society had given me. It was a feeling that I had to reject something in order to be a strong person, even to be myself; I was so used to the idea that I would become nothing if I didn't. After a year I rid myself of this idea and, to my amazement, the contrary was true. It opened everything for me. I felt free and generous. I started doing my best work in 1960, after I came back to New York."

If Marisol changed, so had the configuration of people and ideas affecting the art world. Johns, with his austere renditions of numbers, targets and flags, often framed by plaster casts of body parts, and Rauschenberg, with his motley "combines" of paper, wood, paint, fabric and outrageous debris fished out of garbage dumps, were the hottest artists in town. Castelli, whose status as entrepreneurial standard-bearer of the new and controversial had been ardently reconfirmed by a one-man show he gave to 24-year-old Frank Stella, was living up to expectations by spotlighting and bringing together painters whose notions and priorities revolted the old Cedar Bar crowd. His new batch of protégés—Roy Lichtenstein, Andy Warhol and James Rosenquist—specialized in deadpan examinations of mass culture, particularly its manifestations in TV, movies, advertising, comic books and fast food.

What incensed the older artists, who treasured the painterly brushstroke and the skill of the hand, was that the newcomers commandeered the blatant features of billboards, trashy book covers and other crude illustrations, and the most garish colors and banal lines of commercial art to deliver their message. The stalwarts of the New York School had struggled long and hard for acclaim; the Pop artists, entertaining and broadly understood, had an instant appeal. The first group constantly measured themselves against the giants of modernism. Whereas they wanted to make art for the ages, Pop Art was, as the critic Lucy Lippard pointed out, "determinedly of the present."

The spread of the Pop idiom, aided by a good dose of the anti-art ironies of Marcel Duchamp, then living quietly but sociably in the West Village, infused the art community with zest. Marisol responded emphatically with platoons of huge, empty-headed figures, stiff as Egyptian statues and animated by a whiff of Magritte. Symbols of hollowness within marriage and the family unit (especially domestic coziness and child raising), military might, social demeanor and the presentation of the self to the rest of the world, they demonstrated Marisol's uncanny receptiveness to what was going on around her.

The torso of each figure was usually a cube or rectangular block of wood. Onto this she typically painted, stenciled, drew and nailed other pieces of wood; as time went on, she added plaster, plastic, metal, fabric and glass to her arsenal. The basic tableau was further augmented by real props, from her own clothing to street finds of toys, furnishings and appliances that acted as a recognizable counterpoint to

Sidney Janis Gallery, New York

As a child, Marisol had visions of becoming a saint. This is her *Madonna, Child, St. Anne and St. John.*

The cutting images of Marisol

the fantasy of the figures. The juxtaposition of traditional painterly and sculptural methods with rough carving and battered objects alive with association was strong enough to support the coexistence of devastating criticism and playful humor.

Another device Marisol manipulated to perfection was the introduction of photographs, drawings and plaster casts of her own face and body into her environments. At first she used herself as a model because she did a lot of her work late at night and no one else was available, but quickly enough the potential of studied narcissism for injecting melancholy or enigmatic surrealist notes into her art dawned on her. Illustrations of Marisol on Marisol range from *Baby Boy* and *Baby Girl*, in which monstrous toddlers (each more than seven feet high) display tiny Marisol dolls, to *The Party*, her apotheosis of multiple selves. In this room-filling installation there are 15 figures, all bearing Marisol's features, as if their creator were the ultimate assemblage or found object. (Although Marisol's hand exempted no one, a repeated target seemed to be the inanities of women's lives, perhaps an oblique reference to the kind of existence her mother led, but also a sharp insight into an untenable social situation.)

Between 1960 and 1964, a succession of single figures and elaborate tableaux poured forth from Marisol's studio, each more surprising than the next: *Tea for 3*, *From France*, *ABCDEFG and Hi*, *Mona Lisa*, two versions of *The Family*, *Baby Boy*, *Baby Girl*, *The Kennedys*, *The Generals*, *The Visit*, *Dinner Date*, *Women and Dog*. Important exhibitions followed. Most notably, she was invited to be in the Museum of Modern Art's (MOMA's) definitive "Art of Assemblage" (1961), which conferred respectability on her technique. She also participated in a show at MOMA in 1963, where she had a traffic-stopping room of her own. Between 1962 and 1964 MOMA, the Whitney Museum and Buffalo's Albright-Knox all acquired pieces for their permanent collections.

"I got my first idea for putting together my large figures when Conrad Marca-Relli invited me for a weekend on Long Island," she says. "His wife made hats. In their garage I saw a potato sack full of hat forms. I looked at them and said, 'I'm going to make sculpture with them.' That's how *Tea for 3* came about.

"I first started drawing faces on wood to help me carve them. Then I noticed that drawing looked like carving, so I left it. Then, once, I couldn't get a drawing the way I wanted it, so I put a photograph up to help me. I liked it there. So I thought, 'Why not use a photograph?'

"All my early work came from the street. It was magical for me to find things. There was a thrown-out baby carriage, so I made a mother with her baby in the carriage. I looked down at an old beam in the gutter and I saw the *Mona Lisa*. When I drew in the face and sanded it, the grain of the wood made a smile by itself. It was really spooky. So many things like that happened to me.

"The idea for *The Visit* came from a sofa I found in the street. I had three women sitting there. I needed some clothes so I put a coat on the woman and then my purse with everything in it beside her. It was really difficult to part with my favorite coat. That was another world. I don't feel like doing things like that anymore. It was the beginning of being very free in the '60s. You just wanted to put everything you could into one piece."

The myth of a "Latin Garbo"

In time Marisol was taken up by *Vogue*, *Glamour* and *Cosmopolitan*. Writers cooed over her looks, her figure, her clothes, the parties she attended—and her silences. It was then that the Marisol myth was given its permanent shape: that of an enigmatic "Latin Garbo," someone who wouldn't mind being marooned on a desert island with only herself. Marisol regarded her quiet demeanor as a shield, not a weakness. "In those days," she observes, "I didn't want to give statements or interviews. It seemed a good idea to be like that. Now I see I should have said something. It was a mistake."

The public obsession with Marisol's social life and silence trivialized her. Being categorized as a mysteriously unreal creature was, she told art historian Cindy Nemser in 1975, "a way to wipe me out . . . in the '60s the men did not feel threatened by me. They thought I was cute and spooky, but they didn't take my art so seriously. Now, they take my art more seriously, but they don't like me so much." When I asked Marisol how she felt about those years as a subject of incessant

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Albright-Knox Art Gallery, Buffalo

Marisol's arresting figures of the early 1960s, of which seven-foot-high *Baby Girl* is one, brought her to the attention of collectors. Her enigmatic doll here displays a tiny image of Marisol herself.

interest, she said, "You get a lot of praise and a lot of resentment at the same time. It's not so difficult to be successful. What's difficult is to keep it up."

Prominence, of course, also brought its share of rewards. In 1967 London's *Telegraph Sunday Magazine* commissioned Marisol to create her version of Prime Minister Harold Wilson and the British Royal family. With the newspaper's permission, she added de Gaulle, Franco and Lyndon Johnson to her hit list. "Hit list" because what viewers noticed first was the interplay of ridicule and menace; the good-natured spoofing of *The Kennedys* (1960) had vanished with the upheavals of the era.

The ominous American mood of the late '60s so disturbed Marisol that she left the country. She did not show in New York between 1967 and 1973. She traveled extensively in the Caribbean, South America, India and the Far East. She discovered scuba diving, which led to underwater photography and a series of long, gleaming, weaponlike fish with Marisol faces. A departure from the rough-hewn, fun-and-games Marisol, the fish sculptures and the figure and landscape drawings received polite but unenthusiastic reviews.

The turning point evidently came in 1976, when she quit using drawings and plaster casts of herself as an element in her sculpture. Marisol explains, "Originally using my face was like a search for the self. I don't have to do that anymore because I know I'll never find it." Clearly she was looking outward for renewal, fastening on monuments of perseverance and stability and launching into her remarkable portrayals of de Kooning, O'Keeffe, Nevelson and their contemporaries. Contemplating this cluster of work and other examples of Marisol at her best, it is apparent that this artist's abiding theme is the tensions, dislocations, curiosities and reassurances of family life. The family complex and its extension, the peer group, are Marisol's vehicle for taking our measure. By a fitting irony, Marisol, the stranded adolescent, the shy loner, the purveyor of portable identities, has been singularly equipped to register our victories and failures in forming and maintaining lasting attachments. That she celebrates such emotional adventuring as often as she mocks it, that she can gaze upon us with gentle good humor as well as anger or despair, is an index of her deep concern for the gestures and connections of ordinary life. At a time when much of the art in vogue may very well exhaust itself in its quest after high drama, Marisol's steady seismographic focus seems claim enough on our attention.

Photograph of Marisol in motion was taken by Hans Namuth in 1983, two decades after his first series.

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By David McCullough

The making of *Smithsonian World*: a journey into time and space

No mere studio confection, the Institution's peripatetic new TV series was produced on location in the United States and abroad

The voice that came booming over the phone was so loud I had to hold the receiver away from my ear. The caller introduced himself as Martin Carr, a television producer. There was to be a new series for public television called *Smithsonian World*, he said, and he wanted to meet with me to discuss the possibility of my being the host. I had taken the call in the kitchen, and the others in the room, who could hear Mr. Carr perfectly well, were by now nodding their heads as if to say they thought that sounded interesting. Carr explained that he had read some of my books, and he had seen one or two of the interviews I had done on television. Was I interested?

Of course I was. I was living quite happily on the island of Martha's Vineyard with family, friends, a dog, a horse and a new book under way; I had plenty to do. But I had once edited a series of books published jointly by the Smithsonian Institution and American Heritage, and felt I knew a good deal about the Smithsonian. Besides, I wanted to meet that voice.

We had lunch in Boston at the Parker House. Carr turned out to be a trim, energetic man of about my own age, with a dark beard and a good smile. As I was to learn later, he has had a most distinguished career in television, directing everything from news to soap opera to grand opera, producing a series of notable documentaries (including the classic *CBS Reports: Hunger in America*) and winning virtually every major award the industry has to offer. But what impressed me most at our first meeting was the way he talked about the Smithsonian—his obvious delight in its range of interests and its people.

This would be the Smithsonian's first major effort in television, Carr told me, and the largest television production ever mounted in the city of Washington. "Secretary Ripley is the one mainly responsible for bringing the Smithsonian into the 20th century," he said. "Now he's decided that it's time for television." The funding, $3.75 million for seven one-hour shows, was to come from the James S. McDonnell Foundation of St. Louis.

Each of the seven shows would have five or six different segments on five or six entirely different subjects, but all relating to a single overall theme. A show called "Time and Light" would explore how time is measured by such disparate timekeepers as clocks, calendars, sea urchins, bamboo and telescopes. A show on "Designs for Living" would examine the different ways people have accommodated themselves to life on Earth and in space. Another show, "Speaking Without Words," would look at the unusual ways human beings and other species communicate.

"Imagine!" Carr said, his great voice now in full swing. "Our material can range across everything of interest to the Smithsonian—science, history, technology and the arts!" Did I realize there had never been a television series that combined science, the humanities and the arts all in one hour? "But I think it only fair to warn you," Carr concluded as our coffee arrived. "If you go ahead with this, you will work harder than you have ever worked before."

Upstaged by a hammy giraffe, series host McCullough breaks up while filming a segment at National Zoo.

In Panama, McCullough (rear) descends into canal lock for segment on "Crossing the Distance" this month.

Some weeks later came what might be called a screen test. I was led into a studio at WETA, the Washington public television station that is coproducing the series with the Smithsonian. There, I was seated behind an anchorman's desk and asked to read a sample script on a TelePrompTer, something I had never tried before. I don't know how well or how poorly I did. I know only that I got the job and that I was told to spend some time with a coach named Jerry Krone. A bright, helpful man, Krone began by telling me that there is no more need to be intimidated by a camera than there is to be intimidated by a telephone. "But you're going to have to work hard—harder than you've ever worked before," he said. I wondered what he and Martin Carr thought I had been doing before.

The sessions with Jerry began a year ago in a studio on West 57th Street in New York. He drilled me on the prompter, forcing me to read faster and faster. I talked to the camera by the hour, sometimes sitting, sometimes standing, sometimes walking forward or sideways. My moves were supposed to be made according to marks on the floor, but I was never to look down to find those marks. Talking fast and walking slow seemed more than I could handle. The great thing, Krone said, was to reach the point where I could be myself.

By late February I felt I was making some progress. "But you must remember, David," Jerry said, "it won't always be like it is here in the studio. Sometimes there will be distractions."

"So there I was, suspended in midair"

My first real "shoot" was in Panama a week later. Early one morning, under a big Panama sun, I found myself dangling by a single steel cable from an overhead crane, the concrete floor of an empty lock on the Panama Canal 90 feet below. I was standing in a kind of open cage (left) used to lower construction equipment whenever a lock is drained for repairs. An empty lock is a spectacle not often seen on the canal, and Martin had decided it would make a marvelous shot for a show called "Crossing the Distance," which airs this month. So there I was, suspended in midair by a single strand, trying to deliver my lines above the din of construction and from memory, since a prompter was out of the question.

The idea was to have me descend into view from the top of the frame. Once I had spoken my piece, I was to be lowered rapidly away into the cavernous lock. We did it over and over, and between takes, while Martin and the film crew conferred, I was left out there twisting slowly in the wind, so to speak, which gave me time to think about Jerry and his talk of distractions. By midday, the temperature was just what you would expect in Panama.

That was my first day on the job. In the time since then, we have filmed nothing in a studio. I've been almost continuously on the move in nearly every kind of conveyance—by plane, helicopter and aerial tramway, by train, truck, jeep, subway, bus and taxi, by boat and, of course, on foot. The air travel alone, I'm told, adds up to nearly 100,000 miles.

I've seen parts of the country I never saw before and visited places here and abroad rarely encountered even by inveterate travelers. One week we were in Rome, filming inside the historic Tower of the Winds, part of the Vatican ordinarily closed to public view. The week after we were 2,000 feet below ground in Ohio, at the bottom of a salt mine, filming an experiment on proton decay which could prove to be one of the most important physics events of this century (SMITHSONIAN, May 1983). The week after that I was in the Grand Canyon for the first time in my life, tramping along through impressive rock layers dating from the Permian period and talking about Earth history with Nicholas Hotton, a noted Smithsonian paleontologist and the author of *The Evidence of Evolution*, one of the books I had once edited.

Nuzzled by camels, nibbled by giraffes

I've been up to the top of the Chrysler Building in New York and near the summit of Sandia Mountain in New Mexico. The ride on the famous Sandia Peak Aerial Tramway, the longest in the world, is the opening of "Crossing the Distance." I have talked to an astronomer who is a priest, Father George Coyne, director of the Vatican Observatory, and I have interviewed a former high school English teacher who is now a leading authority on howler monkeys, Katie Milton of the University of California, Berkeley. I have seen tree rings on a redwood in California dating back to the Battle of Hastings, and an atomic clock in Illinois that is accurate to one second every 30,000 years. I've been immersed in Smithsonian history, Smithsonian lore and legend, Smithsonian statistics. I have also, as it happens, been drooled on by Smithsonian giraffes at the National Zoo, and I've been nuzzled by several very large and odorous Bactrian camels (cover) at the Smithsonian's center for animal conservation and research in Front Royal, Virginia, which is no small matter if you're trying to maintain your hostly composure.

Among our most troublesome times were three days in July on Mt. Hopkins in Arizona, filming the Multiple Mirror Telescope, or MMT. To judge by the MMT segment as it appeared last month in the first show, "Time and Light," everything worked as smoothly as the telescope itself. In fact, nothing went smoothly. The weather on the mountain could hardly

In New Mexico, McCullough ascends mountain on Sandia Peak Tramway, also for "Crossing the Distance."

have been worse. We were besieged by pea-soup fog, rain, thunder and lightning, cold so sharp and sudden we had to bundle up in parkas—in July in Arizona! To make matters worse, the mountain was infested with millions of ladybugs that clung to everything like lichen. At one point, we were filming while a huge storm swept toward us and the air was so charged with electricity that my hair stood straight on end. Meantime, to the delight of the rest of the crew, Paul Raimondi, the cameraman, was dancing about frantically with ladybugs up his trousers.

Two days later we were off the mountain and out on the desert, at an ancient Hohokam Indian ruin called Casa Grande, where the temperature was 110 in the shade and we were working in the sun the whole day long. Now, a host is never supposed to perspire under any circumstances, so to keep my blue shirt from soaking through, I had to be wrapped like a mummy with Ace bandages under the shirt.

The heat was so terrific that the zoom lens began to malfunction. As did I. With the sun so bright on one side of my face, it was also necessary to "fill" the other side with a reflector, thereby raising my temperature higher still. By the end of the day, try as I might, I could no longer properly pronounce the word Hohokam, so that a final scene shot in the comparative cool of the ruin had to be done over and over and over. That, as I recall, was the day I became known as 24-take McCullough.

What impressed me most, after spending years at a typewriter working largely on my own, was the extent to which television is a collaborative effort. A crew consists of a producer and production assistant, or PA, a cameraman and his assistant, a sound technician, a gaffer (who does the lighting), a grip or two (whose job description might be "to move stuff around") and the so-called talent (me). Generally, there is a still photographer as well and somebody hired locally to handle advance planning. If we are filming in one of the museums, which is often the case, there is usually a curator present.

Our senior producer, Tom Simon, calls the Smithsonian the best back lot in America. "There's a set everywhere you turn," he says. But to avoid the daytime crowds, we nearly always work in the museums after hours, and there is something magical about being among the treasures of the Nation's Attic in the still of the night.

Everybody on a crew knows what's expected of him or her. Everybody works. On a shoot, 12- and 16-hour days are not uncommon, and in my experience, there is no complaining. "Interview with Fred [astronomer Frederic Chaffee] in front of the mirrors," reads my journal from the morning of July 23 at the MMT. "Six hours later, still working. No coffee break, no lunch. Nobody complains."

At times, the pace gets painfully tedious. An awful lot of time is spent waiting for clouds to go away or waiting for noise to go away—a truck on a highway, a yapping dog, an air vent that starts clanking all of a sudden. Planes are the worst offenders.

The night we filmed in the Freer Gallery, in the famous Peacock Room, we had to stop repeatedly, turn

Lisa Taylor, head of the Cooper-Hewitt Museum, praises designers who gave us "streamlining."

Of historian McCullough's four books, the most recent is Mornings on Horseback, *the story of young Theodore Roosevelt's struggle to manhood.*

In rare TV interview, Anne Morrow Lindbergh (left) recalls epic flights for producer Margaret Murphy.

Ornithologist Eugene Morton and McCullough analyze animal sounds in "Speaking Without Words."

off all our lights, turn on big floor fans and wait for the room to cool down. The Peacock Room is a walk-in masterpiece by the 19th-century American artist James McNeill Whistler—walls, doors, ceiling all done in turquoise and gold leaf. But Whistler painted on leather which is affixed to the walls with a wax adhesive and there was every chance the adhesive might melt in the heat from our lights. So the temperature in the room was strictly monitored and, because of the repeated need for cooling-off time, the segment took all night to film. Around four, we had to stop in the middle of a take because the soundman was picking up the unmistakable presence of snoring. A young production assistant was discovered in a corner, fast asleep on a pile of sound padding.

Troubles have persisted all along. I've continued to flub lines. Prompters don't materialize or fail to work. An experienced electrician plugs a big light into 220 volts instead of 110 and the light goes off like a 12-gauge shotgun, miraculously hurting nobody. One of the crew is stricken with an attack of food poisoning. Airlines lose baggage. Film is ruined for reasons nobody can satisfactorily explain.

I've known moments of enormous exhilaration and total exhaustion, but on one occasion I was plain scared to death. We were at Panama's Barro Colorado, an island which serves as part of the Smithsonian's Tropical Research Institute. Three of us decided to climb a narrow steel observation tower that reaches 140 feet, well above the treetops. The idea was for me and Michael Robinson, a Smithsonian biologist, to go up there and have a conversation, while Chuck Clifton, the cameraman, filmed us against the view. Together

On same program, anthropologist Douglas Ubelaker tells how bone bits reveal personal characteristics.

TV crew interviews aviation expert Paul Garber at National Air and Space Museum's Maryland annex.

Filmed on a maintenance dive, a technician checks phototubes at underground proton-decay tank in Ohio.

Bladder for a space-suit glove emits eerie glow during pressurized leak test on "Designs for Living" show.

with Chuck's camera, we weighed more than 600 pounds and by the time we were two-thirds of the way up, the tower was swaying, as were the trees in the wind all about us. On top, the sensation was one of being tossed in a green sea. When I looked at Michael for reassurance, I saw that he had also turned slightly green and was inching himself to a sitting position on the floor. Chuck, his voice suddenly gone thin, said it might be a good idea to make the conversation brief. The resulting scene, also part of the second show, is brief indeed. In it, Michael and I look amazingly at ease, and the giddy sensation of being on the tower is completely lost.

Some of the most moving moments of all have taken place within the Smithsonian. Once, in a dimly lit warehouse at Silver Hill, Maryland, part of the Smithsonian's storage and restoration facility for historic airplanes, I stood in the empty bomb bay of the *Enola Gay*, the plane that dropped the atomic bomb on Hiroshima. I could see from the bomb bay into the cockpit where the pilot and crew sat. Hardly anything had been restored. Seats, instruments, everything was in tatters. It was like standing in a ruin.

Then there is Washington's magnificent old Patent Office Building, which houses the National Portrait Gallery and the National Museum of American Art. We have filmed there several times and the building itself never fails to stir me. It is among the oldest, most historic government buildings in the nation's capital, and among the greatest works of Greek Revival architecture in America. It served as a hospital during the Civil War. Walt Whitman walked there among the wounded who were lying row on row, in halls now filled with paintings and other art. Lincoln's second Inaugural Ball was held there, and the great Lincoln portrait by G.P.A. Healy dominates the impressive hall of Presidential portraits.

Curiosity plus vitality equals fascination

If there is a word to characterize the spirit of the series, I suppose it is curiosity. Just about everything we have done is based on the old premise that the world is endlessly fascinating, and the more you know about it, the more fascinating it becomes. To help convey that feeling, we have turned to people both within the Smithsonian and without, some celebrated, others known chiefly within their fields, but all characterized by a common vitality.

I think, for example, of Michael Robinson and how he talked of the secrets still to be unlocked by science in the tropical wilderness, and his outrage over the loss of such wilderness to development—annually, an area about the size of Pennsylvania. I think of Smithsonian astronomer Fred Chaffee and his enthusiasm for the

In segment on streamlining, McCullough checks classic Cord phaeton near sleek Los Angeles bottling plant.

Multiple Mirror Telescope. The feeling an astronomer has when working with the MMT, he said, is the same as the feeling a violinist might have if given a chance to play a Stradivarius. I think of Lisa Taylor, head of the Cooper-Hewitt Museum in New York, whose whole face lights up when she talks of the work of Raymond Loewy and other industrial designers who gave us "streamlining" as an antidote to the Great Depression.

To a remarkable degree, the series has become a chronicle of pioneers—an ornithologist at the National Zoo, Eugene Morton (p. 71), who has broken a code in animal communications; a construction boss named Barbara Res, who is the first woman to take charge of building a New York skyscraper, the glittering new Trump Tower; a University of Michigan physicist, Dan Sinclair, who with a handful of others built the proton-decay experiment from scratch.

I've known for a long time that we live in one of history's greatest ages of discovery, but never have I felt it so strongly as I did the day I stood in the salt mine with Dan Sinclair, looking at the proton-decay apparatus. Not so long ago, every physics book taught that the proton, one of the building blocks of the atom, is absolutely stable. But in the mid-1970s along came a new theory, declaring the Universe to be much simpler than we thought—and much less stable. Now we suspect that protons do decay, and so there in Ohio, nearly half a mile below ground, 2,048 amber-colored phototubes, each about the size of a sunlamp and many thousands of times more sensitive to light than the human eye, are watching in the dark, in a giant pool of ultrapure water (opposite), waiting to pick up the infinitesimal burst of light that will occur when a proton disintegrates. What's the point? "If we can understand how the proton decays," Sinclair says, "we can also understand how it was created."

Another day none of us will forget was our interview with Anne Morrow Lindbergh for a segment in "Crossing the Distance." The interview was filmed at Mrs. Lindbergh's home in Connecticut. She had agreed to talk in depth about the epic flights she made with her husband in the 1930s, in a plane called the *Ting-*

missartoq, a Lockheed Sirius, which hangs in the National Air and Space Museum not far from the *Spirit of St. Louis*. She was "crew," as Charles Lindbergh said proudly at the time—his copilot, radio operator and photographer on two momentous and dangerous flights to chart overseas routes for commercial air travel.

As the day of the interview approached, I was filled with anticipation and an enormous feeling of responsibility, because I realized that Mrs. Lindbergh had never talked about this part of her life on television before and probably wouldn't again. I had told her we would be delighted if she could give us an hour or two. Instead, she held us spellbound for five hours. She is a tiny, delicate woman, but our overwhelming impression was of great inner iron. We felt we were in the presence of someone who has lived in the heroic mode and none of us—and I expect none who see the interview on the air—will ever look at that plane in the Air and Space Museum without thinking of all it took to do what she did.

It was dark outside when the segment producer, Margaret Murphy, told me she thought we should stop. I was worn out. But not Mrs. Lindbergh. "What would you like me to do now?" she asked brightly.

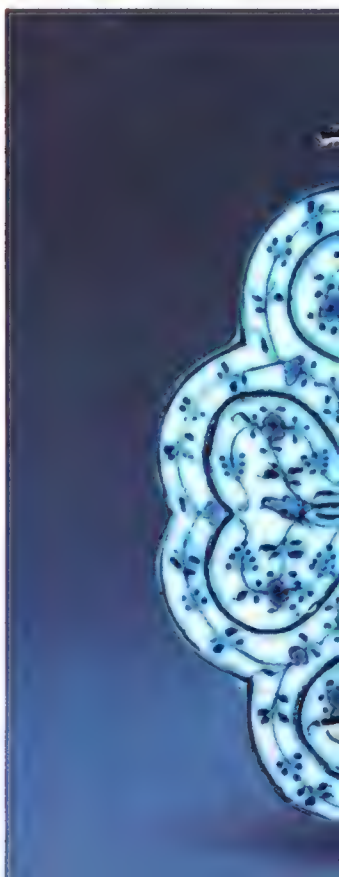
Mrs. Lindbergh likes to quote a line from Alfred North Whitehead, "Without adventure a civilization is in full decay," by which the eminent philosopher meant primarily the adventure of ideas. That certainly is a theme implicit everywhere you turn in the world of the Smithsonian—that and the continuity of civilization. Nothing happens in a void, or ever has. Science, art and history all move in steps.

For me, the making of *Smithsonian World* has often been difficult and demanding—as hard and, yes, maybe even harder than anything I've done before. But it has been invigorating, too, as only the new, different and difficult can be. I've learned things about the medium of film that I only dimly perceived before—the emotional power that can be brought to history, for example, when rare old footage is combined with the first-person recollections of a born storyteller like Mrs. Lindbergh. I've found, among the people I worked with, a level of professional pride and stamina that supposedly has vanished from American life. I've rediscovered what a miraculous creation the Smithsonian is, and how very much more there is than meets the eye. Maybe most important of all, I've been constantly reminded—*shown*, really—what an infinitely fascinating age we live in right now.

After 20 years of innovation on the Mall, Secretary Ripley says it is time for a major effort in television.

On location at Grand Canyon, host McCullough and paleontologist Nicholas Hotton discuss geology.

Precious



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Look at any one and you see history and art. Look at all and you see tragedy and transcendence. They are what their owners wanted them to be: links in a chain of beauty and faith. They intended them for future generations, and they have become ours. So long as we treasure these things, the people who loved them can never be "extinct."

That's one reason we sponsored this exhibition, and why we urge you to see it at the places and times listed below. In our business as in yours, we need to be reminded that the measure of the meaning of our lives may one day be the things of beauty we treasured and preserved. Sponsorship of art that reminds us of this is not patronage. It is a business and human necessity.

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"The Precious Legacy: Judaic Treasures from the Czechoslovak State Collections" appears at the Bass Museum of Art, Miami Beach, January 21-March 18, 1984; The Jewish Museum, New York, April 15-August 26, 1984; San Diego Museum of Art, San Diego, September 22-November 18, 1984; New Orleans Museum of Art, New Orleans, December 15-February 10, 1985; Detroit Institute of Arts, Detroit, March 12-May 5, 1985; The Wadsworth Atheneum, Hartford, June 3-July 29, 1985.

(top left) AFTER THE BURIAL, (Artist Unknown), ca. 1780; (bottom left) TORAH CROWN, Repousse, 1840; (top right) PORTRAIT OF A BOY, Isadore Kaufmann, end of 19th century; (bottom right) PORCELAIN PASSOVER PLATE, Joseph Vater, ca. 1900; (bottom center) ALMS BOX, (Artist Unknown), early 19th century. "The Precious Legacy" is organized by the Smithsonian Institution Traveling Exhibition Service (SITES), in cooperation with Project Judaica, Mark E. Talisman Chairman, and the Ministry of Culture of the Czech Socialist Republic, the Federal Ministry of Foreign Affairs of the Czechoslovak Socialist Republic, the National Committee of the Capital of Prague, and the State Jewish Museum in Prague. Photographs by Quicksilver Photographers, Washington, D.C. "The Precious Legacy" is published by Summit Books and is available in book form. © Philip Morris Inc. 1983

By Ellen Ruppel Shell

Tomorrow's car is taking shape now in Pasadena

Automobile makers around the world look to California's Art Center College of Design for the people to lead them into the future

Mark Gorman assumes driver's position alongside a two-dimensional, full-scale rendering of a SAAB 900. He was a team leader on the project, which was paid for by the Swedish aircraft and auto manufacturer.

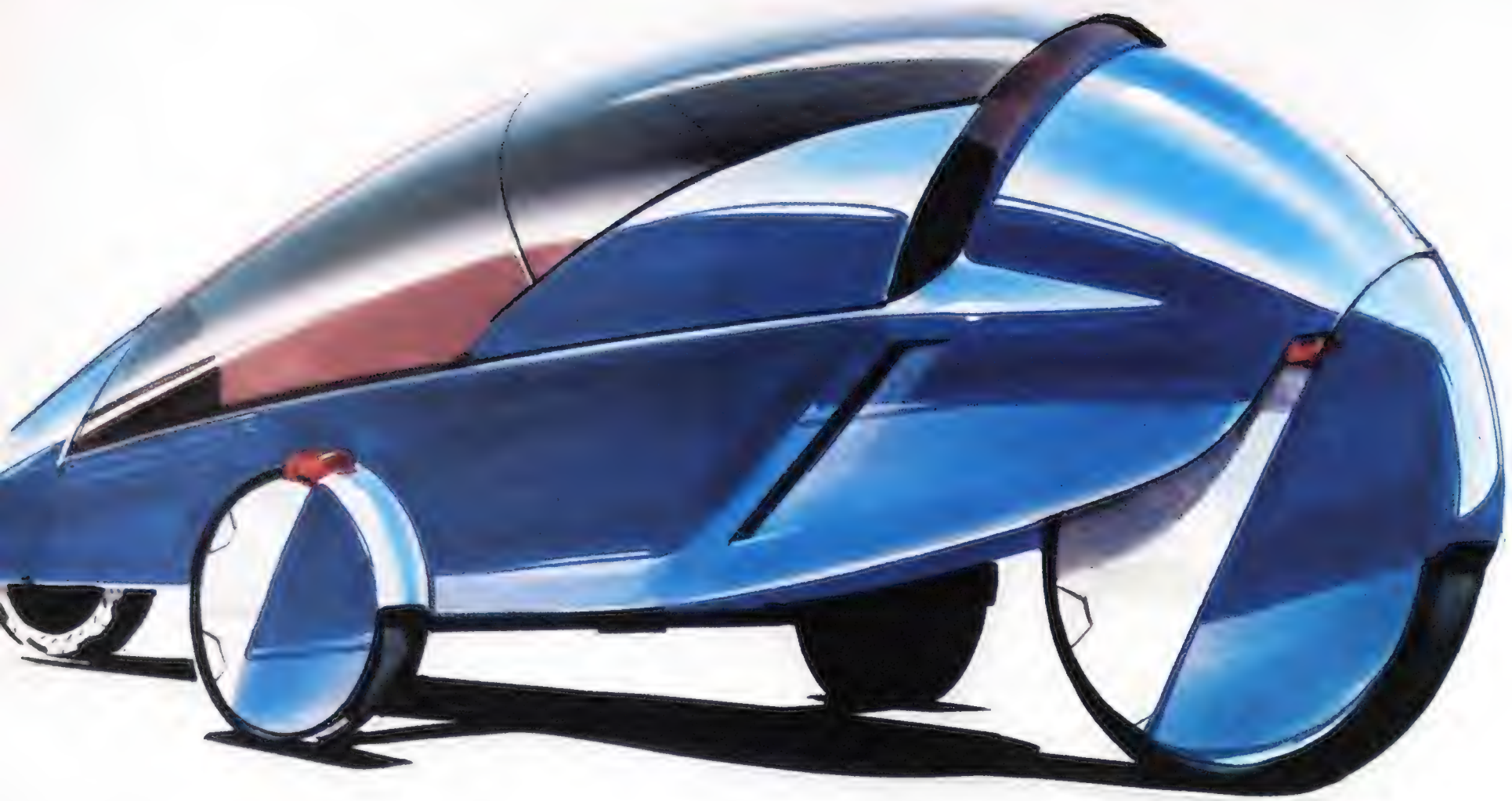
Southern California is no place to counsel moderation, least of all when it comes to the buying, selling or driving of automobiles. Many people here feel about their cars the way the rest of us do about our reputations—without the right one they may as well pack up and slink away.

Given the area's infatuation with four-wheeled vehicles, it should come as no great surprise that the bottom half of the state has recently become an important outpost for the automotive industry. Manufacturers from Japan and Detroit have established branches here to pick up on tastes they believe predate trends in the rest of the world by as much as a decade. Designers in these "advanced concept studios" are charged with sorting through these California notions, mixing them with their own and translating the resulting ideas into designs for tomorrow's production cars. The studios are small, but they are staffed with some of the best minds in the business. And though these mostly young, freewheeling designers may differ radically in approach and outlook, most do have one thing in common: four years of hard work at the Art Center College of Design in Pasadena.

Emeline King, here displaying her concept sketches for a van, is now a designer for Ford in Detroit.

Perched high on a hill overlooking the San Gabriel Mountains, Art Center is a stone's throw from the Rose Bowl but light-years from Detroit. Yet it is the training ground for more than half of that city's automobile designers. Every year recruiters from Detroit's Big Three automakers flock here to vie for the two dozen or so graduates of the school's transportation design program. The competition for students is stiff: many graduates join the more glamorous ranks of Porsche, Citroën, Fiat, Volvo and other European

Photographs by Peter Menzel



The sleek vehicles on these two pages are all stages in a design exploration performed for General Motors.

This sketch is by Rob McCann, who graduated last year, now works in GM's Advanced Concept Center.

manufacturers, where they are very welcome. As one representative of a French automobile company put it: "If I could fire all my designers and replace them with only Art Center graduates, I would."

Auto companies do not wait for graduation to get involved with the students, however. They frequently invite the students to take part in design explorations, in which a company presents a basic idea and the students take a semester to develop it. In a typical project, designers from the company will visit the class three times during a semester, offering suggestions and, more important, giving the students the chance to work shoulder to shoulder with professionals. All three major American carmakers have participated in these projects, as have SAAB and Volkswagen.

The Art Center school was founded 54 years ago by Edward (Tink) Adams, a harried New York art director who came West in search of rest and relaxation. He never found it. Instead, he and a group of like-minded friends pooled their resources to establish a school that would teach all aspects of design, an art they believed was taken all too lightly by existing institutions of higher learning. Since then the Center for Creative Studies in Detroit and the Royal College of Art in London have begun similar programs, as have a number of universities.

Art Center has come a long way since those early days when, legend has it, founders pawned their cars to pay the rent on the handful of studios the school occupied near downtown Los Angeles. Today 200 full- and part-time faculty teach 1,200 full-time students in a gleaming steel-and-glass structure built in 1976 at a cost of $9 million.

The curriculum, too, is expansive. It includes six major areas: communications design (as in advertising), fine arts, illustration, photography, film and industrial design. The transportation design program, part of the industrial design department, was set up just after World War II. The first director, an Art Center graduate with a dozen years' experience in Detroit, believed that design was to be learned at the drawing board, not in the library. Theory is still kept

Ellen Ruppel Shell, a Boston free-lance writer who specializes in scientific subjects, was formerly a senior editor at Technology Illustrated.

to a minimum here. Required courses are crammed in during the evening after a full day in the studio, and homework is rarely done until dark. All-night dashes to meet deadlines are not unknown. Indeed, most people rushing around Art Center, portfolios in one hand, forgotten cigarettes in the other, seem to teeter on a fine line between exuberance and exhaustion.

"The point is not to run this place like a boot camp, but to teach students to allocate their time and energy in a professional manner," explains Don Kubly, a former advertising man who has been president of Art Center since 1969. "Industrial design, particularly in the automobile industry, is getting very competitive, and we want students to be able to make a smooth transition into the working world with no illusions about what's ahead."

Art Center transportation design students may have no illusions, but they have plenty of dreams. Unlike many of the illustration, photography and fine arts majors who prance from class to class in high-fashion clothes and designer shoes, the "trans" students, usually in T-shirts and jeans, appear downright conservative. But their drawings, models and ideas quickly belie this impression.

Restraining a passion for motorized vehicles

"To be a car designer you've got to have 40-weight oil in your blood," says Brian Baker, a 23-year-old senior from Indianapolis. "We're a hybrid of artist and engineer, but we have something you don't find in either one of those professions: we try hard to put the feeling people get out of driving a car into the design, a kind of personality that could never be preprogrammed."

Baker has joined a few other transportation majors for dinner to chat about new directions in automobile design. All of the students admit to a passion for motorized vehicles, a passion they've demonstrated since early childhood when they found themselves sketching trains, airplanes and automobiles instead of snowmen and flowers in elementary school art classes.

"Most of us are so enthusiastic about what we do that we have to restrain ourselves from designing family cars that look like formula-one racing cars," laughs Lloyd Walker, a 23-year-old from Kansas City. "Little spaceships for the road are lots of fun, but they are not responsible design."

Although the students agree that appearance is often what ultimately sells a buyer on an automobile, they insist that other factors, such as safety and comfort, are more important design concerns. Gone are the days when designers were merely stylists who could commit their fantasies to paper and expect the engineering department to make them a reality. The Art

All drawings courtesy of the Art Center College of Design

The "Shrike," a model at one-fifth scale by Andrew Ogden, is shown leaning as if banking into a turn.

McCann's version has four wheels; the outrigger wheels extend at rest and retract at high speeds.

Craig Taylor's three-wheeler seats two people in tandem. He is now working for Peugeot in France.

Keith Teter (center, in jacket), industrial design chairman, critiques drawing by Masato Inoue, left.

Center philosophy has always been to put sound engineering principles ahead of fashion, and today that tradition is more important than ever.

"My father's generation grew up driving thundering, rolling airships for the road," says Baker. "But this generation has a lot more technical savvy. The electronics boom, the space race, even the 55-mile-per-hour speed limit are influences no other generation has had. And the people we'll be designing for—kids 15 years younger than ourselves—they're technology junkies. They want the ultimate in everything: fingertip controls, instrument panels instead of dashboards —almost like videogames you can drive."

But Eric Schumaker, a 20-year-old, third-year "trans" major from Detroit, says that this obsession with high-tech gadgetry is a fad headed for the same fate as the tail fins and heavy chrome of the '50s. "You can't play videogames while you're cruising down the freeway," he says. "We have to refrain from putting too many gimmicks on a car, like digital dashboards and computer-assisted everything. That's not honest design."

Talking to these and other Art Center students, one quickly gets the correct impression that they are not your average bunch of undergraduates. In fact, most entrants have at least two years of college behind them, and nearly a quarter have bachelor's degrees. An annual tuition of $6,165, which does not include materials charges that hover close to $1,000 per semester, keeps the less serious away, as does the requirement that all candidates submit a portfolio of drawings and conceptual work. There are very few dilettantes at Art Center, and not one who makes it through the transportation design curriculum.

"No one wants to pay you a dime or give you an inch of space to design today's cars. You've got to think ahead of current expectations!" So says instructor Harry Bradley to a roomful of fourth- and fifth-semester designers who have gathered to have their ideas ripped apart by his no-holds-barred critique. Bradley, a successful independent designer, has built custom cars for movie stars as well as consulted for major automobile manufacturers the world over. He learned the business the hard way, working in studios at General Motors in the 1960s when the political and economic climate was anything but conducive to innovative design. He migrated to Southern California where he took a job designing the original line of toy model cars known as Hot Wheels. From there it was on to his own business, and a one-day-a-week teaching job at Art Center, where his specialty seems to be deflating swelled heads, while at the same time inspiring students to go beyond what they had considered their best.

"You are using clichés in a way that doesn't communicate anything," he cautions one young man, whose sketches are taped for all to see on the classroom walls. "If you continue to draw this way you will experience a constant gnawing away inside that will eventually betray you." And to another student: "You can fool a lot of people a lot of the time if you draw this well. Your ability, which is great, will haunt you your entire career. Drawings like this look very good on paper, but when you try to model them you get nothing. That's how we got the 1971 Eldorado. It looked great on paper, but we all know what it looks like on the road."

The students sit on backless stools, their legs twisted uncomfortably, their hands fiddling with one or two of the dozens of felt-tipped markers—some in old beer six-packs, some in more formal carriers—that are the most important tools of their trade. A few, who know their designs are below par, bow their heads as Bradley

David Weise applies tape to drawing of a police car. Car is higher than most to seat tall officers in hats.

Richard Hutting, at left, works with transportation majors on a one-fifth scale clay model of a new SAAB.

points out error after error. Others, more sure of themselves, argue vigorously, explaining the rationale behind what the instructor soon convinces them was a less than ideal design decision. Such mistakes range from shading in a car window with black ink ("There is no such thing as pure black or pure white—this looks like some Darth Vader reflection") to mismatching the front and rear ends of the car. By the time students graduate from Bradley's class, their pens no longer betray them as wishful thinkers or, worse still, charlatans. Their designs will have become as workable as they are attractive.

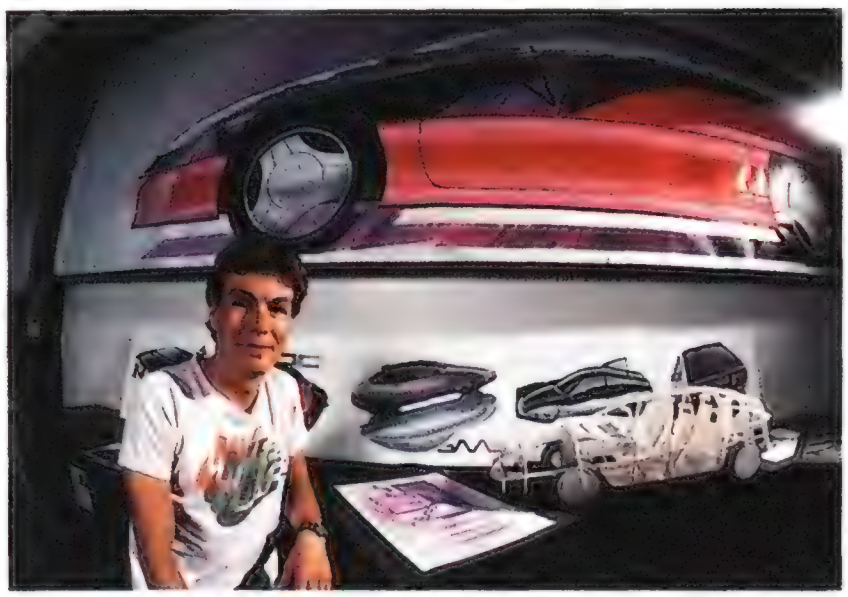
In another studio class, this one a bit more advanced, students are given full rein to let their imaginations fly on a variety of projects ranging from a "manned orbital transfer vehicle" designed to carry satellites and serve as a sort of tugboat in space, to a much more down-to-earth but still very high-tech motorcycle. The idea is to be as innovative as possible, while keeping basic principles of ergonomics, safety and efficiency firmly in mind.

"My feeling is that 90 percent of all cars are driven with only one person inside," says Orrin Shively, a 24-year-old student from London. This belief has led Shively to depart radically from convention with an "urban vehicle" that accommodates no more than two people comfortably at a cruising speed of only 40 miles per hour. "This car is designed around people, it envelops them," he explains. "American cars are still terrible in the way they treat the driver; the French, for example, are much more concerned with driver comfort. This design is closest to a Citroën." Designed for maximum maneuverability, Shively's car can steer with its rear wheels to edge into tight parking spaces, and has doors that slide back to allow easy exits onto too-close curbs. It is a playful, youthful design, yet surprisingly practical.

Across the room, David Weise, 26, fifth-term student from Hamilton, Ontario, fleshes out his drawing of a new-wave police car. Most police cars are stock production vehicles converted with a paint job, an upgraded suspension and engine, and a string of lights. Weise's model integrates features that police want.

"This car is built for cops from the bottom up," explains the burly six-footer. Oddly, no police car on today's market is bulletproof. Weise put bulletproof Lexan plastic into his car's windows and windshield and bulletproof Kevlar into its door panels. He built a roll cage into the body and uprights on the bumpers to ease crashes through all kinds of barriers and for pushing other vehicles. The front seat is enlarged slightly to ensure comfort for the officers, and the rear passenger compartment has a steel bar for clipping handcuffs, but no door handles. The warning lights are built into the roof, which is a bit higher than average to make room for tall policemen wearing hats. And the whole package is relatively lightweight, turns on a dime and gets better-than-average gas mileage. It's a design most police departments would covet. But instructor Keith Teter, head of the transportation design program, is not yet sold. "It still looks too much like a production car," he mutters. "It hasn't quite taken that final leap out of the genre."

A 1957 graduate of the college, Teter worked at the Ford Motor Company for 12 years and headed the teams that designed some of that company's biggest sellers, including the Mustang, the Maverick and the Mach I, before returning as head of Art Center's industrial design department in 1969. A self-confessed car freak, he owns nine classic automobiles, and photographs and models of these and other cars are the only



Freeman Thomas graduated near top of his class, now is a designer for Porsche, maker of his favorite car.

A collapsible, motorized scooter for downtown use is contemplated by its designer, Eric Schumaker.

distractions in his otherwise stark office. Teter is adamant that students reach far beyond the obvious in their pursuit of better design. Boring cars, as epitomized by what he calls the "econobox" subcompacts popularized a few years back, have no place on his or his students' drawing boards. But neither do pie-in-the-sky renderings that have nothing to do with the realities of the marketplace.

"We don't want our students building cars like tract houses," Teter says. "We encourage them to think into the future, to be really creative while letting them know the hard facts of building and selling in volume. We teach them responsibility but also not to be timid.

"Good engineering means good design," Teter continues. "The design opportunities created by technology over the past 20 years have really improved the look of cars." And the number-one influence in both design and engineering, he says, has been the application of aerodynamics, a concern brought on not by any considered corporate philosophy but by the mid-1970s oil crunch.

In stop-and-go driving at less than 20 miles per hour, fuel consumption is primarily determined by vehicular weight. But on the highway, air resistance becomes a critical factor. At 55 miles per hour, a conventional family car uses approximately 65 percent of its horsepower and 60 percent of its fuel just in overcoming air resistance. Detroit recognized the importance of decreasing drag only in the past ten years or so, and General Motors is so far the only Big Three company to install an on-site wind tunnel for testing the aerodynamics of full-scale vehicles. But European automakers—particularly Pininfarina SpA, the half-century-old company responsible for the Ferrari and designs used by Fiat, Alfa Romeo, Peugeot, Mercedes-Benz, Cadillac and Rolls-Royce—have long attended to this factor. So has Art Center, whose students use a wind tunnel run by the California Institute of Technology.

Striving toward the clean, uncluttered look

The move toward minimum wind resistance has vindicated designers who for decades have fought the marketing departments' demands for such wind-catching embellishments as fancy grilles, fins and hood ornaments. Art Center is very much in the forefront of this minimal-frill tradition, and none of the young designers here has any interest in ornamentation. Pininfarina is the ideal, and the supersleek, low-slung designs that fill classroom walls and galleries attest to the students' loyalty to the no-nonsense school of automotive design that calls for simple, clean, uncluttered "rolling sculptures."

"I'm a purist, I like a minimum of character lines on a car," says Freeman Thomas, a 26-year-old designer

for Porsche who was one of the top students last year. "Porsches are timeless because they don't rely on lines —they're all shape."

Thomas, known not only for his design savvy but for his habit of listening to the track sounds of Daytona Raceway through tape-recorder headphones as he sketches, is one of a new breed of "global" designers who will, many predict, dictate the shape of cars in the future. While it once was assumed that the French would buy French-built cars, the Germans, German-built, and the Americans, American-built, today's automakers have no such guarantees. Ten years ago almost all Art Center transportation graduates went to Detroit. Now they can be found from Spain to Indonesia and just about all points in between. In fact, head designers at Volvo in Sweden, Porsche in Germany, and Toyota, Mitsubishi, Nissan and Honda in Japan are all Art Center products.

Competition from Europe and Japan as well as the increased cost of fuel has caused American carmakers to totally rethink their products. This, Art Center faculty and students agree, is all to the good. It has led, they say, to a more rational approach in American design. While auto design in this country used to be considered a necessary evil and was dominated by an overpowering marketing department, in the last decade or so it has become an integral part of a new car's conceptualization. This has resulted in smaller, better-built automobiles with cleaner lines, better fuel efficiency and fewer frills. It has not, however, resulted in a major change in thinking that will launch American automobile design into a new orbit all its own.

"Car design is an evolutionary business," explains Teter. "Wheels aren't going to disappear overnight, and you won't see electric cars replacing the internal combustion engine in the near future. How can you revolutionize a product when the essential problem—that of putting people in a pod and moving them from one place to another—remains the same? This is a business of microrevolutions. There has never been an open-checkbook policy in the auto industry the way there was in the space program; no one has ever said, 'Take that car and get it to the moon!' "

After a week at Art Center, though, one gets the feeling that if that project were ever undertaken, it would get its start here.

Brian Baker puts finishing touches on wheel cover on a full-size rendering of a Lincoln for the 1990s.

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By John W. Turner jr.

Given a free rein, prolific mustangs gallop into trouble

Protected by law now, herds of wild horses are overrunning their habitat, but a new antifertility drug may help put a stop to that

Early on a crisp October morning, pilot Dan Kettle and I clattered across the high desert country of central Idaho in a small turbocharged helicopter with a big Plexiglas bubble. We were searching for wild horses, and soon two bands of them materialized directly below us. With their long shadows, they looked like small ships sailing on a sage-green sea. We dropped toward them with a nauseating lurch and they began to run. I picked out our target, a sorrel stud with stocking legs and a telltale white patch on his side, and when he broke clear of the others we stayed right behind him. I leaned out of the bubble, aimed my gun at his left flank and squeezed the trigger. *Pop!* A brilliant orange splotch exploded harmlessly on the animal's hide just before he disappeared into a stand of timber, another pony painted for science.

We didn't zero in on that horse arbitrarily. He was one of about 100 animals that were involved in an unusual research project. In that part of Idaho, and, for that matter, throughout most of the Western states, the wild-horse population was booming out of control. My partner, Jay Kirkpatrick, and I were trying to find out if a new antifertility drug could be used to reverse the alarming trend. Having administered the drug to ten stallions scattered over a 250-square-mile area, we needed some way to mark them and the other horses in their bands for easy identification. The best solution, we decided, was to "shoot" the animals with paint balls, and we agreed that the most efficient way to do it was by helicopter.

Leaning from helicopter, author Turner draws bead on a stallion as free-roaming band stampedes in Idaho.

The gun fires harmless paint balls that "brand" animals in a current population-control experiment.

Photographs by Michael Mauney

After injecting stallions with an antifertility drug, Turner studies shy animals with powerful binoculars.

Since we started our project ten years ago, Jay and I have demonstrated that we can indeed hold wild-horse populations down. That's good news for the horses, for wild-horse lovers all over the country and for Western cattlemen who are worried about the impact of the animals on their grasslands. Until now, there have been just two decidedly unscientific ways to deal with proliferating "mustangs," as wild horses are called out West: kill them or round them up for adoption. The drugging approach constitutes a scientific option that is cheaper, easier and far more humane than the other two. It works in Idaho and we believe that it can work elsewhere, too—if and when it is given the chance.

When I first met Jay at Cornell University in Ithaca, New York, wild horses were just about the furthest thing from our minds. We were both hard at work earning our doctoral degrees. He was specializing in reproductive physiology at veterinary school. I was studying hormonal control of animal reproduction at the university's College of Arts and Sciences. Our friendship led to a number of backpacking trips in Montana, and later, although our careers took us to different places—Jay has been teaching and doing research at Eastern Montana College in Billings and I'm similarly employed at the Medical College of Ohio in Toledo—we managed to get together every year for a reunion in the wilderness.

It was in a dusty Montana saloon on our way back from one such trip that we heard several cowboys complaining about "those damned wild horses." Jay and I were shocked. Everybody knows cowboys love horses. We started asking questions and the cowboys told us that there were far too many mustangs on the range. They were using up good grazing land, they were "useless" and they ought to be shot. Soon thereafter, Jay checked out the facts at the Billings office of the Bureau of Land Management (BLM), an agency of the Department of the Interior that oversees some 170 million acres of grazing land in the West. That's when we began to get involved in the sad and exasperating plight of the American wild horse.

Many people think horses are as indigenous to the West as cacti and coyotes, but in fact they are not native species at all. Derived from both Spanish Barb and Andalusian bloodlines, they were brought to this country by Spanish explorers in the early 1500s. Inevitably, some of them escaped or were set free, whereupon they began to reproduce in the wild. Bands formed, the natural selection process took over and the creatures survived in, and were molded by, their harsh environment. They became vitally important to the Plains Indians, who captured and redomesticated many of them, but the vast majority continued to roam wild and free across the prairies.

At one time, there may have been more than a million horses in the Western states. By 1969, the number had dwindled to less than 17,000. For the better part of three decades, beginning in the 1930s, the horses were put under tremendous pressure by "mustangers," who ran down the creatures. Many of the animals were slaughtered and processed for pet food. Some were sold for personal use or rodeos. Mustanging was a tough life but it paid, and the men who did it were relentlessly efficient. In 1933 and 1934, for example, more than 20,000 horses were removed from the Big Horn Basin in southern Montana alone.

In those days, there was no legal apparatus for protecting the horses and it was only a matter of time, given the vivid excesses of the mustangers, before public indignation began to mount. In 1971, bowing to intense pressure from humane groups spearheaded by a tireless Nevada housewife known as "Wild Horse Annie" Johnston, Congress passed the "wild free-roaming horses and burros" act. That legislation, which bans the killing, capture and harassment of wild horses on federal lands, has had mixed results.

The horses have been preserved but now their population is just about doubling every seven years. Because the wide-open country the horses prefer is so arid, a huge amount of territory is needed to feed them. The amount of available land is limited, however, and the result in many areas is a deterioration of the range so severe that it can take 40 years to recover.

John Turner teaches at the Medical College of Ohio in Toledo, where he also does research in animal reproduction. He writes for professional journals.

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Naturally, since their sheep and cattle share the BLM's grazing lands with horses, ranchers are concerned. Some of them would like to go back to the dog-food days. Others want the BLM to expand its controversial Adopt-A-Horse program. At the opposite extreme of the political spectrum, some conservationists are adamantly opposed to any sort of meddling.

Jay and I decided to jump into this mess because we thought we had the necessary scientific background to help the BLM find a way out of it. Certainly we had the motivation. By then, as a result of our camping out West, both of us were pretty enthusiastic about wild horses. To us, I guess, they had come to symbolize some of the things we liked about the country—open spaces, a sense of freedom, toughness. Moreover, we had a hunch that some sort of antifertility drug was the answer. Eventually, with the support of our respective institutions and a $200,000 grant from the Department of the Interior, we succeeded in developing one.

In an equine-research lab at the University of Pennsylvania's New Bolton Center in Kennett Square, we tested four potential substances on 24 ponies. As a result of that work, we decided to try out a steroid hormone that controls the reproduction process in male mammals. This substance was available in a timed-release form that is similar in principle to the system used in some medicinal capsules, but active for a much longer period of time—three to six months.

The steroid hormone had most of the characteristics we were seeking. First, it caused infertility by severely reducing sperm production. Second, because it was long-acting, a single injection could be effective for a whole breeding season. Third, sperm counts came back up a couple of months after the drug was gone, which meant that the infertility was reversible. Finally, it did not interfere with the stallions' basic sex drive.

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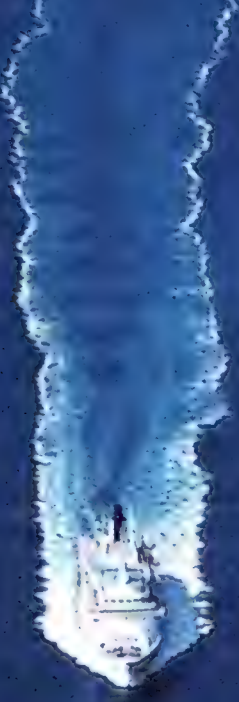

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Trouble on the mustang's comeback trail

The last characteristic is important because of the social structure of the wild-horse herd. Upon reaching sexual maturity, young stallions are ejected from their bands. After a while, they attempt to gather harems of their own, each containing from two to 11 mares. They mate with the mares and defend their harems against other males looking for mares. A drug that interfered with the sex drive would cause problems, since the natural selection process would be greatly distorted when dominant stallions deferred to any males that wanted to breed their mares.

Launching a field study of the drug turned out to be more complicated than developing it. For several years in the mid-1970s, we collected data on the reproductive biology and behavior of the wild horses in the Pryor Mountains of southern Montana. But when we were ready to test the drug there, we ran into a stone wall. Some horse-protection organizations had spread misinformation about our project, arousing such strong hostility among the local people that we had to leave. We moved to the horse range near Challis, Idaho; a year later, we treated ten stallions there several months before the 1980 breeding season.

We used a dart-firing rifle to inject the drug. The procedure is virtually painless for the horses but it took a little practice before we got the hang of it. We started out shooting darts into straw targets. Then we chose, as our first stallion, a charismatic, pale-gray creature called the Lone Pine stud after the 10,000-foot Lone Pine Peak that dominates the range. He is a magnificent creature with flared black nostrils, a shining golden mane and a long tail. He is also very smart, as we were soon to discover.

A graduate student named Anne Perkins and I set out to stalk him on horseback one cool morning. About halfway up the mountain, we noticed that our $400 Australian dart rifle had slipped unseen from its scabbard. We backtracked and, miraculously, found the gun intact. Then it started to hail. By the time we arrived at our vantage point on the east side of the mountain, it was sunny again. We tied the mares in the trees. The Lone Pine stud and his band were grazing about 600 yards away and it took us 20 minutes to work our way unseen into a downwind position within firing distance. We slowly raised our heads above the boulders. The stud was gone.

We heard whinnying and a commotion way back up in the timber and we looked at each other. No, we thought, he'd never do that. He'd never run off with a saddled horse, even if she were in heat. But he sure did. When we arrived, panting, back at the tether, one mare was gone. We found her about two hours later. We didn't catch up with him until the next day.

Our aim was to keep a close eye on the bands of the darted stallions for two years, so that we could measure the impact of the drug on reproduction and then find out if the foal counts returned to normal after the drug wore off. In the middle of the project, however, a complication arose when the BLM announced plans to conduct an adoption roundup in our vicinity. That's when we came up with the paint-ball idea. Since the study bands would be marked, and the roundup team would be instructed to leave them alone, both the research and the roundup could proceed.

The BLM's plan was to gather up bands in the areas of greatest population density. Theoretically, that would prevent major disturbances in the social structure of the overall herd, which numbered some 650 animals, while easing overgrazing in the hardest-hit areas. For three days everything went along smoothly under the supervision of BLM manager Don Smith and wild-horse specialist Ben Garechana. Helicopters were used to help herd the animals, and people were hidden in the sage to harry the stampeding bands past the point of no return into concealed trap-fences.

Results are positive: fewer foals

Since that drive took place three years ago, I've spent a lot of time in the Idaho sage watching our treated horses, and I have some promising things to report. The drug worked. There was nearly an 80 percent decrease in foal counts among our study bands. The data on behavior patterns reveal nothing abnormal. Just as important, the infertility seems to be reversible, since the foal counts in the treated bands were back to normal last year. The foals looked healthy, too. Of course, that initial trial must be repeated to verify the results. But even if a second trial, too, is successful, there is no guarantee that a major fertility-control program will be implemented. There's the rub.

Above all else, the issue of wild-horse management is

Rounded up for adoption, weary mustangs are herded into funnellike trap-fence after running for miles.

Turner and veterinarian examine fresh blood samples taken to make sure horses are healthy for adoption.

Undertaken to ease population pressures, roundups are tough on the frightened horses. As preparations are made to herd penned animals onto truck, stallions unaccustomed to each other bite and fight constantly.

a political one. Many BLM people have worked hard to make the Adopt-A-Horse program an ongoing concern, and some of them have no enthusiasm for the drug approach. Our goal, however, is not to eliminate adoption but to supplement it.

The Adopt-A-Horse program arose out of the most humane instincts at a time when there was no viable alternative. But it is a complicated enterprise and a very expensive one. The cost of rounding up some 200 animals in Idaho alone may be as high as $100,000. On top of that, the roundups are hard on the horses; over time, they may even have a destabilizing effect on the social structure of the entire herd. By contrast, two persons using a helicopter and a dart rifle could drug a 500-horse herd for an entire year in just two days—and cut population growth in half. The cost and stress on the animals would be a mere fraction of that required for adoption.

Our initial proposal to develop a fertility-control program was tabled by the BLM because it was a "poor investment." Now that we have demonstrated its feasibility, Jay and I are hopeful that one day soon the agency will support *it* for adoption as well as horses. Fiscal prudence suggests that after years of harassment we owe these doughty animals the kind of genuine freedom that only applied science can deliver.

Roundups may be needed only in special situations if the Department of the Interior adopts antifertility drug for widespread use. Then perhaps most horses will be as wild and free as this burly Idaho stallion.

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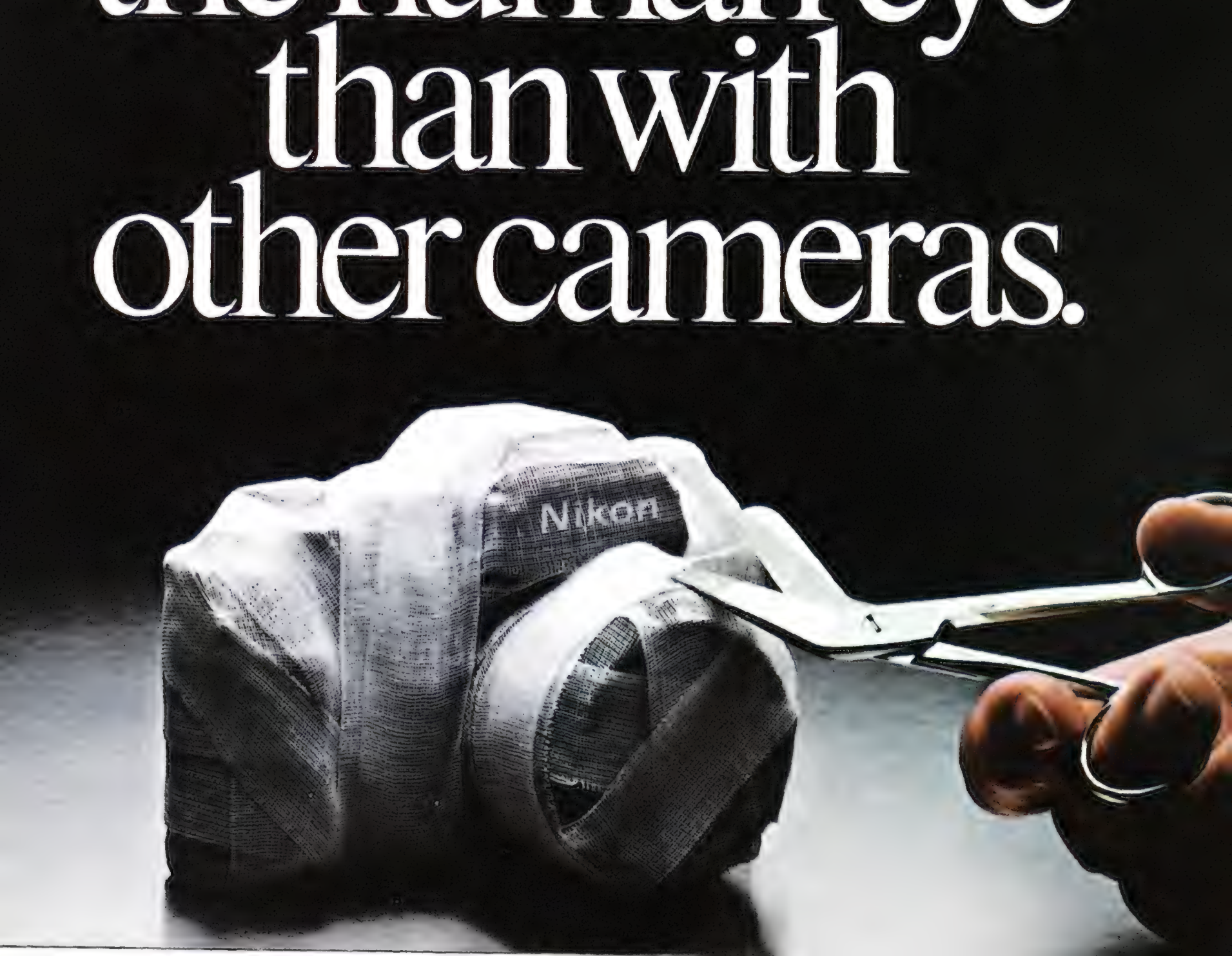
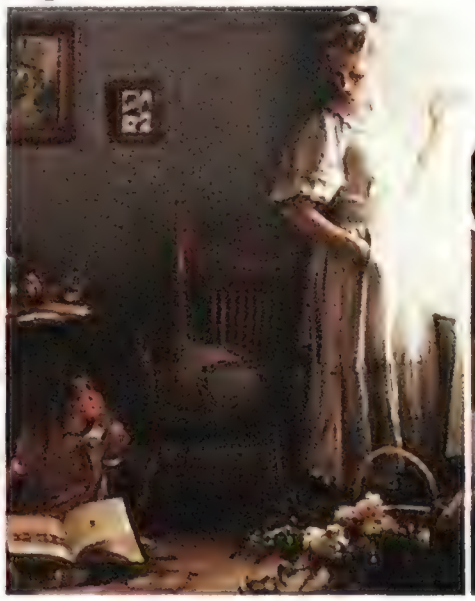


High contrast. Shot in Aperture-Priority with the Nikon FA.

Back light. Shot in Programmed with the Nikon FA.

Available light. Shot in Programmed with the Nikon FA.



Sun-in-frame. Shot in Shutter-Priority with the Nikon FA.

Shot in Aperture-Priority with a leading multi-mode SLR camera.

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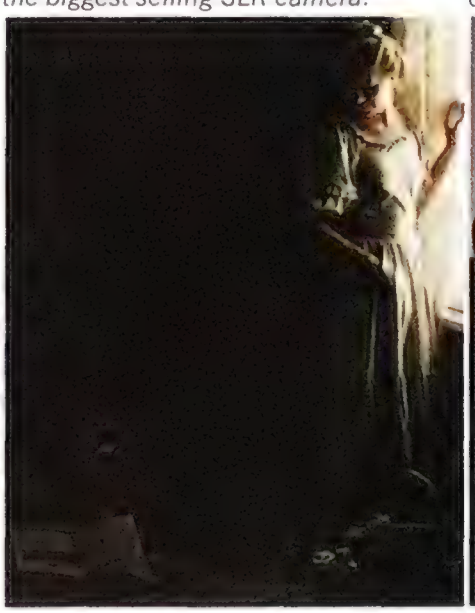

Shot in Shutter-Priority with a competitor's "top-of-the-line" SLR camera.

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Boonter to hungry *haireem*: "No kidding, your good dinner, potatoes and biscuits will be a bit late."

By Jack Fincher

In Boonville, Calif., 'Boontling' is now a *lingua* not so *franca*

But locals still meet to harp *and to* horn,
as well as play buzz chick*; their odd lingo*
is not yet ready to pike to the dusties

The Boontling Club of Boonville, California, met the other day and a terrible thing happened. Nobody came. Well, that's fooling with the truth a bit, *sharkin with the earth a slib,* Boonters would say. Edna and Leo Sanders were present, but they were the hosts. The president, Wes Smoot, was there, and so was the secretary, Betty King. But two dozen other residents—staunch Boonters all, up to now, in preserving what may be the most unusual homemade language in the world—were conspicuously absent. Don Pardini, the poet laureate of Boontling, just plain forgot.

"Everybody says it's gone this time for sure," Leo Sanders was saying down at the Horn of Zeese (Cup of Coffee) café. Leo, 80, a retired schoolteacher, wore a tall cowboy hat, bifocals and a tan Western shirt studded with a pattern of bright-blue desert flowers. The Horn of Zeese, 100 remote miles north and west of San Francisco, is a Boonter hangout. You can get every kind of *bahl gorm* (good food) from *boarp slibs* and *easters* (ham and eggs) to *broadie* (beef) burgers and *jeffered boos* (French fries).

"They say, 'Nobody left but Leo and his wife,' " Leo goes on. " 'They're the only ones doing anything about it.' " Two other locals who were supposed to come and *harp* (talk) Boont for the visiting *greeley* (journalist) haven't showed.

"Boont's been around a hundred years," owner Ken Jones says, reassuringly. "It'll still be around in another hundred."

Maybe so. Maybe not. Boont hit its peak before World War I, when most of the isolated Anderson Valley's thousand inhabitants could speak or understand the lingo. In those days it was nothing to walk into the nearby hop fields or sheepshearing pens and hear dozens of young people—generally males but not always—*harpin* away as they ate or worked. It was always the current tongue on the town baseball team, mostly used for bawling to base runners signals that sounded like mere gibberish to the opposing team.

During World War II the lingo was often written home by valley GIs as a way of telling where in the

Illustrations by Arnold Roth

Boonter sweeps displaced English words into a dustpan beneath the watchful eyes of Webster.

world they were at the time without having their letters run afoul of the censors, just as it was used in local high school yearbooks for colloquial inscriptions meant for Boonville eyes only.

Especially since automobiles began to bring more and more people into (and out of) the valley, it has been in decline. Today it serves most satisfyingly as a quaint but effective means of *sharkin* (fooling) the *bright-lighters* (city folks) who venture into the Horn of Zeese for coffee and make the mistake of asking driving directions from a Boonter. Leo Sanders even has his own special seat reserved at the counter expressly for that purpose.

The language is a curious mixture—more than a thousand words and phrases from Scotch-Irish, Northern English dialect, Pomo Indian, rustic sheepherder jargon and lusty logging vernacular—all slammed together to hold a lot of vivid allusions, many of them embedded in local history as far back as the 1880s. (The words—"Boontling" and "Boont"—are themselves the result of a high-speed rear-ender between two English words, Boonville and lingo.)

Just how and why it got started is forever in dispute. Some folks say adults invented it to talk about grownup matters in front of children. Others say children invented it to talk about grownup matters in front of adults. But one thing is certain: in its own colorful idiom, the language can get pretty frank.

Take the time at the turn of the century when two fellows on horseback rode up to the general store. Not finding anyone behind the counter, one of them went into the back room, where he surprised the clerk and a hired girl in flagrante delicto (not Boont) on a bale of burlap bags. "Why," he blurted to his companion, as he burst out, "they're . . . they're *burlappin* in there!"

Burlappin it was and *burlappin* it remains to this day. Even now, Boonters like Leo Sanders would have you believe, if you utter the word "burlappin" around town it is as if Adam and Eve were only a couple of generations removed and you should lower your voice whenever you speak of snakes and apples.

Context is nearly everything

In the words of one who has studied the matter, when it comes to comprehending the rich root meanings of Boont, "If [context] isn't everything, it is *nearly* everything." Early on, in fact, Boontling got its impetus from the identities of townsfolk whose names came to stand, as a convenient shorthand, for what their friends and neighbors usually thought of when they were mentioned. Thus did a kerosene lantern become a *floyd hutsell*, a power crosscut saw a *martin isaac*, a smoking pipe a *tony bloker*. Thus, too, did *price babcock* come down as hard apple cider, *jay esser*

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"He surprised the clerk and a hired girl on a bale of burlap bags. 'Why,' he blurted to his companion, "They're . . . they're *burlappin* in there!' *Burlappin* it was and *burlappin* it remains in Boonville."

(after the initials of a litigious man named J. S. Ornbaun) as a lawsuit. *Charlie brown* is pie (because at meals Charlie always ate the pie first). *Hardies* are gloves (a glad-hander, Hardy was never without them). *Jeffer* equals fire (Jeff Vestal loved to build roaring blazes in his hotel). *Flories* and *loweezies* will do respectively for light-bread biscuits (Flora's specialty) and baking-powder biscuits (Louisa's).

Oh, like a housewife who needs a cup of sugar, Boontling did tend to borrow in a pinch! Words like *sluggin* for sleeping (Yorkshire dialect), *dishin* for cheating, *yattin* for talking (Scotch), *treekin* for walking (Scotch-Irish), *gormin* for eating (from gormandize), *boshe* for deer and *boo* for potato (Pomo Indian), *brego* for sheep and *dulcey* for sweet (Spanish), even *glimmers* from American slang for eyeglasses.

Author Jack Fincher frequently contributes to SMITHSONIAN. *One of his recent articles (July 1983) was about George Ferris and the famous wheel.*

As to figures of speech, the Boonter takes *dubs* (seconds) to no one, thank you. If you loaf you are *cuttin buckeye* (a soft wood), if you work hard you are *white oakin* (a wood infernally hard to cut), which makes you an *otto* (after an industrious old Scandinavian immigrant) for sure. A *trashmover* is a heavy rain (but not as heavy as a *loglifter*), a *bulrusher* a person of unknown origins (see Moses, in the), and a *lockin* or *cockin match* a wedding or argument.

Should you feel *tongue-cuppy*, moreover (a graphic rendition of what the tongue does when nausea leads to vomiting, hence Boont for sick), instead of *scottied* when you get up in the morning (hungry; for a forever ravenous town mutt of that name), then better take a trip to the *shoveltooth* (an early Boonville doctor had protruding teeth).

Brevity, however, is uppermost—or as oldtimer Charlie (Shot) Wallach was once heard to remark: "If we keep workin' on this Boonville lingo, we can say 'tweety-tweet-tweet' and get three days' talkin' done."

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Grannyhatchet (Boont for a buck with unusually large antlers) observes fierce-looking *boshers* (deer hunters) with alarm. Already bagged is a *boarch dom* (pheasant); in hand, a beleaguered *beljeek* (rabbit).

Ways of keeping it short start with simple compression: *moshe*, for machine, is an example. But there are much more complex contractions:

Kai beleegr'n. "The coyote was (or is) in a hole (below ground)."

Grannyhatchet, shied shaggy. "It was a buck with large antlers [above]; he appeared to be crippled as he ran away."

The Boonter is so eager to get on with it that he has elevated compression to a fine linguistic art. Witness *leeber* for Grizzly bear, *beljeek* (from Belgian hare) for jackrabbit, *skipe* for sky pilot or preacher, *plenteeble* for plenty *bahl* (a Scotch-Irish word associated with goods of high quality), *pleebler* for ball player, *tobe* for tobacco and *skee* (rhymes with "see") for—what else—whiskey.

In 1960 Boontling got its own lexicographer, one Charles C. Adams, professor of English at California State University, Chico. Off and on for six years, Adams cast a skeptical but scholarly eye at the infrastructure of Boont.

He noticed its onomatopoeia: *spat* for pistol, *keebarl* for rifle shot, *nickelonked* for broke because it recapitulates the sound of a five-cent piece hitting the table. He pondered freighted references to folks long gone but, in Boontling, still as celebrated and as alive in their own way as Ireland's notorious Captain Boycott. While drinking many cups of *zeese*, for Z.C., Zachariah Clifton, a man known for the infamy of his coffee, Adams considered Boont's bitten-off compressions, often cozily wrapped around inner meanings. (*Smalch* for small change or coins, but *seertle* for fish, after the sores on their tails suffered by the native spawning salmon, and *tidrick*—from tea drink—now meaning a social occasion of any kind.) He found that Boont makes some surprisingly sophisticated distinctions. A *walter levi* is a phone, named for the first man in the valley to have one. But a *buckey walter* is

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A Boontling Sampler

ark to wreck
bahl gorm good food
barney to kiss or hug
big end to strike out in baseball
bluebird to unseat and throw a rider
boarp pork (from combination of stem "boar-" and first letter of "pig")
bowgley a big lie; a whopper
briney to hit a home run (to nearby Pacific)
bucky a nickel (from Indian head on same)
buckeye to loaf (see also **white oak**, p.104)
buzz chick baseball (sound of ball moving through air and slapping into catcher's mitt)
can-kicky angry; disgusted
charl to milk a cow (like sound of milk striking the bottom of an empty pail)
codgy old; decrepit
dubs two of something; a pair; double
dulcey sweet; candy
dusties a cemetery; a grave
earth truth
fence jumpin adultery
flories light-bread biscuits
glimmers reading glasses
grayb an old man (gray beard)
haireem dog (derives from "hairymouth," to describe an *Ur*-Airedale)
hardies gloves
harp to talk, especially Boontling
hig a dollar, or to loan or give money to
higgery a bank
horn a drink, or to drink
jay esser a lawsuit
jeffer a roaring fire
jeekus a donkey or a mule (from jackass); also, brandy
leeber a bear (from grizzly bear)
log-lifter an unusually heavy rainstorm
moshe machine
nonch harpin taboo language
otto to work hard (after Otto, an industrious logger)
pickem-up billies dirty socks
pike to the dusties to die (travel to the grave)
pleeble to play ball
region farm, or area
shoveltooth a doctor
slug to sleep
smalch small change
spilldukes a fistfight
weech a small child (affectionate term)

a pay phone, not in a bow to Bucky Walters, the famous Cincinnati Reds pitcher, but to both Levi and to the Indian brave (buck) on the nickel it once cost to make a call.

To be *cy millered* is to be befuddled, an allusion to an early fire crew which let the Similia family's home burn to the ground while foolishly searching for the blaze at Cy Miller's house.

In his subsequent doctoral dissertation, Adams had to admit that Boontling is not, properly speaking, a language. For one thing, it does not have all parts of speech. Like English it is top-heavy with nouns; the basic structure is English too. What is really peculiar to the lingo is its vocabulary. Consider, for instance: "*Dom* in the *dukes* is worth *dubs* in the *shams*" (A bird in hand . . .). Boont is simply a "fascinating linguistic phenomenon," technically an amazingly elaborate jargon with topsy-turvy applications all its own.

Sentinels at the academic gates

Nationality, for example, is generally connoted by tacking onto the word *boar* (a word stem conveying the idea of "male sex") the first letters or so of the English word for the people in question: *Boarf* for French (as in fries), *Boarch* for Chinese. Thus does *wee Boarnip* (for Nipponese) *moshe* translate as a small Japanese car. But *Boarp*, which should be Portuguese or Polish, perhaps, rather redundantly means pork, except when (in context) it means pancake syrup, after two legendary valley trenchermen known as the Boarp brothers, who habitually drowned all their food in sweet, sticky rivers of the stuff. Curiously, the only song translated into Boont has a chorus that closes as follows:

> With an oink-oink here, and an oink-oink there;
> Here an oink, there an oink, everywhere an oink-oink
> *Bahl codgy kimmie* had a *region*
> In the *Drearies*, O.

"Boont's not unique," explains Adams. "It's a jargon, just like the slang of teenagers, inner-city blacks, CB-radio communicators, even the lingo used by the Pitcairn Islanders left by the mutiny on the *Bounty*. What makes Boont unusual is how extensive it is—and how durable."

With that, Adams finished compiling a Boont dictionary, wrote a book called *Boontling: An American Lingo* (University of Texas Press, 1971), donated some of the royalties to the Boontling Club for helping him, and left the guarding of the academic gates to sentinels like Leo and Edna Sanders.

The Sanders have since done what they can. Edna taught Boontling a while in grade school, as a kind of

adjunct subject to encourage third-graders to learn English. Leo and two other club members gave a course to a smattering of interested adults one semester at Mendocino Community College, which means there are a couple of dozen people walking around with Boont (described as "English 98") on their transcripts. But much of the club's sentry duty of late occurs at informal meetings, where (in a process that would please the word tasters of the Académie Française) individual members bring proposed new words to be considered gravely by all the others and accepted if they "feel right"—an arcane process that Leo describes as "getting the feeling they fit or don't fit."

Ken Jones nods. "When I first moved here, that made two restaurants and a bar all run by Joneses. So I told Leo when Boonters went out, it ought to be to *jones-it*. But that never got approved."

"I came near to having a word turned down myself," said Leo, clearly an all-but-unthinkable prospect. "A TV cameraman asked what I would call him. I thought a while and pretty quick I said, a *stumpy mosher*. Now, *moshe* is machine and *stumpy* is a picture—named for an old photographer who had a wooden leg. The club insisted that a camera's not a machine. I said, why the hell isn't it? Around and around we went. But little by little they all agreed with me."

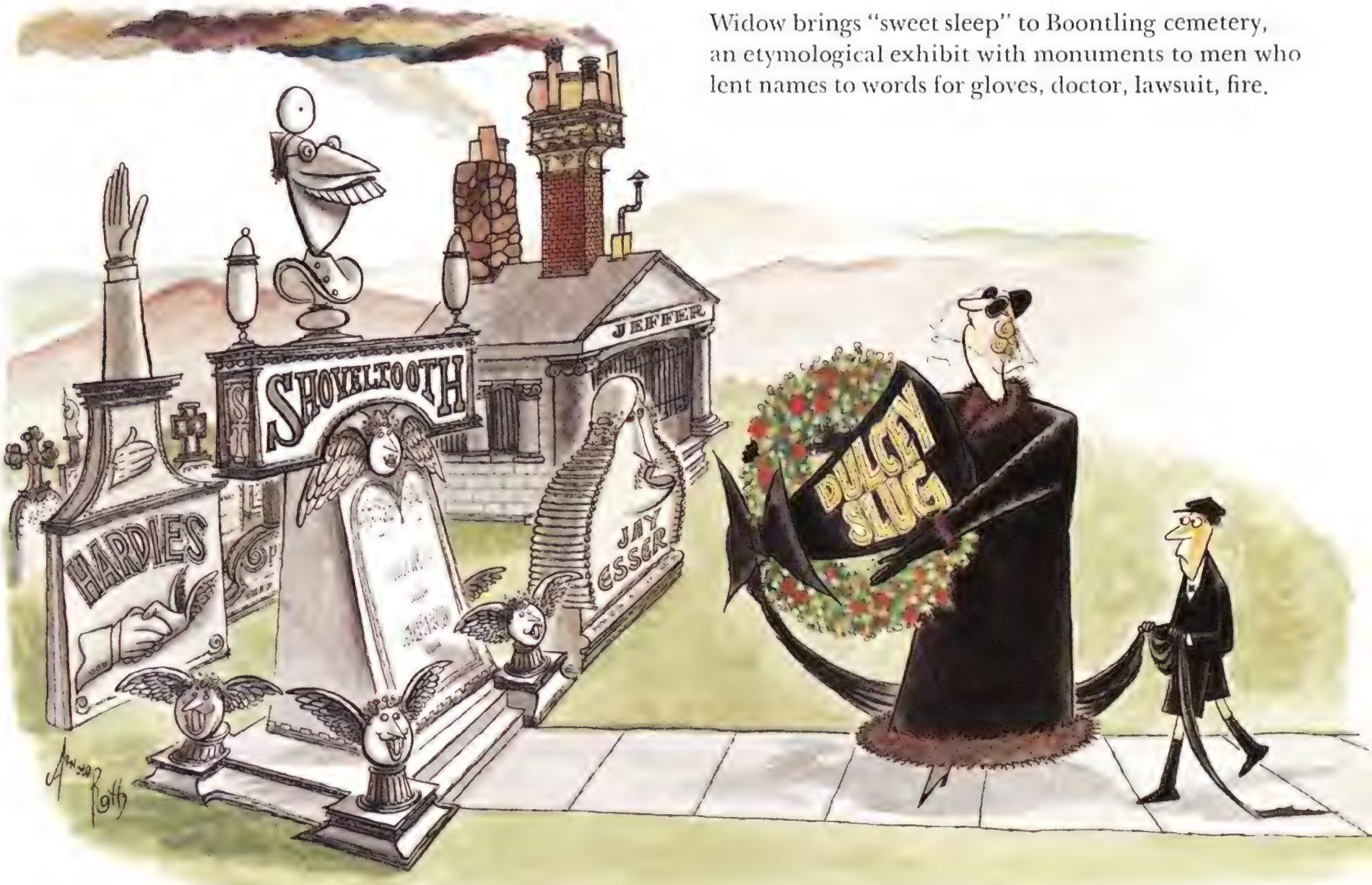
Boontling today, Leo makes clear, is a game that anybody with the knack can play. His grandson, Rob, for instance. "A while back, Rob's maybe seven, and somebody said another fellow had more upstairs—was, you know, smarter—than somebody else. And Rob up and says, 'How many steps, Grandad?' I got it right away. How many steps in those stairs. If you've got *many steps*, you've got a lot of smarts. The club talked it over, and that was it."

Ken Jones was silent a moment. "I don't believe it will die out," he said finally. "It just can't die out."

The interview ended. "*Jape easy*," Leo Sanders called out as the visiting *greeley* got in his car. "*Don't ark your moshe.*"

The *greeley* waved and drove off, feeling a *slib* sad. Any language that does not use the words Cold War, balance of terror, pacification, destabilize, unilateral withdrawal, viable options and sending the wrong signal is sure to be missed.

Widow brings "sweet sleep" to Boontling cemetery, an etymological exhibit with monuments to men who lent names to words for gloves, doctor, lawsuit, fire.



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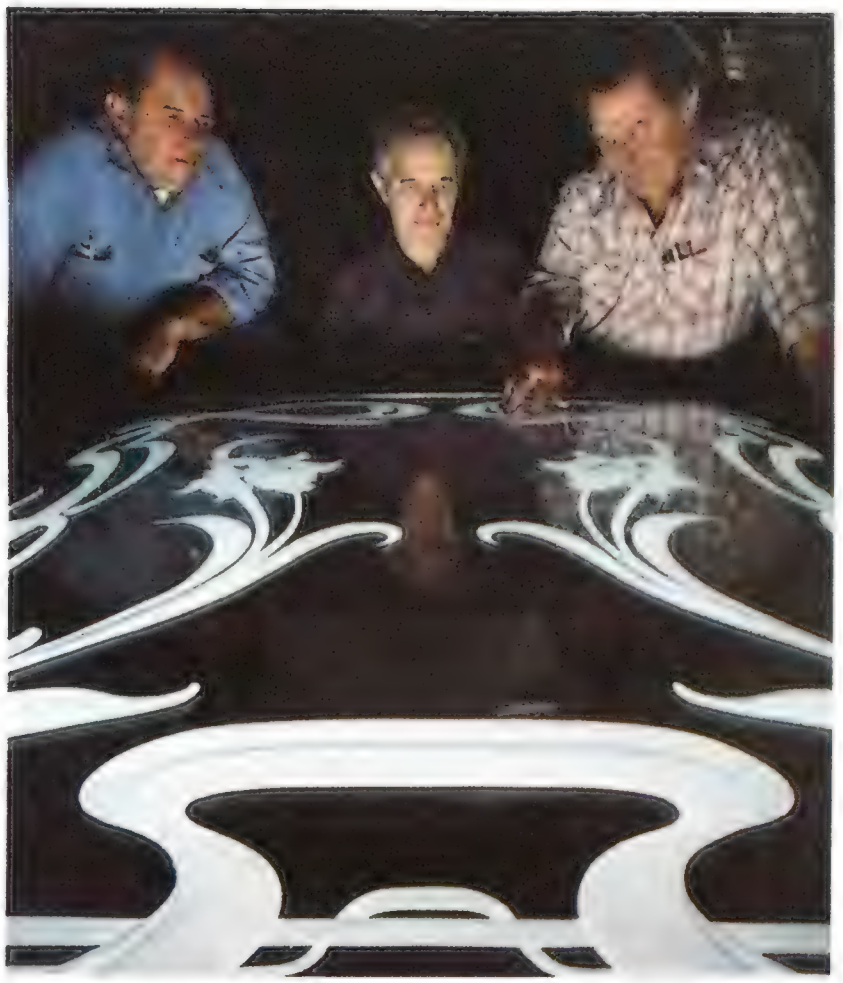
Provider of Urgent Health Care Services for the Athletes of the 1984 Olympic Games

By Phil Patton

The fragile art of going through a glass lightly

The three Shefts brothers of the Bronx have revived the delicate craft of sandblasting; their admirers take great pleasure in the pane



From left, Ike, Sam and Charles carefully inspect a glass partition made for a Manhattan restaurant.

When Charles Shefts was growing up in the Bronx, his mother would take him to the movies and he would draw things he saw on the screen: trains, planes, cowboys, Indians—above all, Indians. A teacher noted young Shefts drawing Indians in his class, for hour after hour. During a meeting with Shefts' mother the teacher asked, "Do you have any Indian blood?" In fact, the family was Russian.

Charles Shefts is still drawing: he prepares the designs for the carved glass panels he makes along with his brothers Sam and Ike. Their work decorates such high-fashion restaurants as Tavern on the Green, Maxwell's Plum and Regine's in New York and such major hotels as the Waldorf-Astoria, the New York Hilton and Atlantic City's Golden Nugget.

The return of worked-upon glass is tied to a wider revival of decoration in architecture and interior design. "It is part of the inevitable cycle of classicism and romanticism," believes designer Milton Glaser, who has used glass most recently in the Great House, a private restaurant in Miami, Florida.

Stained glass enjoyed the first share of the new popular interest in the material. Appreciation of etched and carved glass came later, growing from the sensibility of Art Deco, with its constant tension between the flat and the carved surface, and its joy in stylization. Carved glass also has its antecedents in European cafés and restaurants, where it functions to divide spaces without heaviness or darkness. It is a delicate form of glassworking and the Shefts' shop is one of the outstanding ones using that technique in this country. Often, other glassworkers refer clients to the Shefts. "We're the glass people's glass people," says Sam Shefts, who supervises and executes the intricate sandblasting work.

The Shefts' studio, in a nondescript building near a Sanitation Department depot in the South Bronx, is full of works in progress. The main floor is filled with finished and partially finished panels and with the plywood-and-metal booths where the glass is carved. The Shefts carve not only clear glass but mirrors, black glass and colored pieces. A single panel, representing about 60 man-hours, may cost $4,000 or $5,000. And while the Shefts commonly have ten or 15 projects going at a time, they never have more than nine craftsmen working for them.

There is a Georgian fire screen, decorated with elements of stately architecture. There are two panels with designs by the major French artist Jean Dubuffet. Elaborate partition panels for a Washington restaurant feature detailed views of the Capitol and the White House. Sam Shefts is finishing work on a set of panels on which swirls a fantasy of water lilies, goldfish and frogs.

Upstairs in the old industrial building, Charles

This fanciful carved mirror, installed in New York's Tavern on the Green, came from Shefts' Bronx studio.

Photographs by Don Carson

With his hands inserted into wood-and-metal booth which contains work in progress, Sam Shefts sandblasts individual pieces to be superimposed later on fancy glass background panel. The process dates from 1870.

Shefts and two assistants lay out the designs. They work from rough sketches by architects and designers, and transfer their drawings by tracing paper and charcoal to masking material. Then, with X-acto knives, they cut out the proper shapes in the mask.

Books on orchids and tulips and scenic vistas lie around the shop for clients to peruse, but the Shefts' real pictorial archive is in Charles Shefts' head—an archive he has been assembling ever since he entered his first Bronx movie house.

"I just have all these images filed away," Charles says. "That's my strength: I remember what all sorts of things look like." His visual memory works well with another talent: an ability to translate practically any image into one that lies comfortably in the shallow space of the glass.

Those skills are what got Charles into the business in the first place. Returning from service in World War II, he stopped by a glass shop that had advertised for a designer. The owner told him to come up with a sample design for a vase. He pulled out a pencil and paper, sketched for a couple of minutes and laid down the paper. The owner huffed in disdain, but finally paused to look at the finished design. "What! You did that already?" he asked. "How did you do that so fast?" Shefts was hired. A few years later, Charles started his own business. He soon brought his brother Ike in to work with him. Sam, the youngest, came later.

Sam is the chief sculptor of the three. And Ike, from years spent putting up with his brothers, knows how to deflate their sometimes overambitious designs. "He's always saying, 'What did you put that in there for? Take that out,' " Charles says. It is Ike, somehow, who ends up driving to Washington and back to deliver pieces; Ike who barely survived one cold and windy day on a precarious ladder, one story above the ground and three more above the Hudson River, installing a new window.

The Shefts' shop was not always so full. In the 1950s the type of glass they make was out of fashion. Some of their jobs were "insurance" work—replacement

Phil Patton writes on art and design. His article on skyscrapers appeared in last October's SMITHSONIAN.

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panels for the old glass in the gracious buildings along the Bronx's Grand Concourse. (Finally, however, the once-majestic street reached such a dilapidated state that no one bothered with repairs.) The Shefts also fabricated decorative stained glass, ceramic and walnut wall panels.

"We made it through because we were used to hard times," Sam says. "We were Depression babies." The Shefts' father, who had served in the Czar's army before emigrating to Tennessee in 1906, was paralyzed by a stroke after the family moved to the Bronx. For much of the Shefts' childhood, the family was on relief.

By the late 1960s, there were signs of a revival of interest in all sorts of crafts. For the Shefts, the harbinger of good times was Warner LeRoy, owner of Maxwell's Plum, who walked into their shop one day in 1967. He hired them to produce decorative mirrors for his restaurant. Later, they did work for Maxwell's in San Francisco and for LeRoy's showcase Tavern on the Green at the western edge of Central Park. For Tavern on the Green, the Shefts worked from Currier and Ives designs, but also included women with plumed hats and other decorative figures.

The appeal of the Shefts' work, says Kenn Yesmant, chief of design for Warner LeRoy, lies in its "glittery quality, its beauty and theatricality. Sam Shefts goes a lot deeper into the glass than anyone I know. His glass seems almost three-dimensional."

The Shefts have since created glass for New York's Russian Tea Room on 57th Street, for numerous new hotels and for private residences around the country. Of a restaurant decorated with Shefts glass, former *New York Times* restaurant (as well as art) critic John Canaday noted that "they could serve sawdust and we would still recommend a visit, just for the décor."

So valued a resource have the Shefts become to designers that, not long ago, an architect and an interior designer nearly came to blows over them. Each man said he had a glass sculptor he wanted to work on a restaurant. They heatedly argued the virtues of their respective choices for 15 minutes before discovering that they both had the Shefts in mind.

The Shefts prefer to call their work "carving," not blasting or etching. "I got in an argument with a critic once about that," Sam says. "She said it was blasting; I said it was carving. We use the blasting the way a

Emblazoned on the window at the Old Ebbitt Grill, a reincarnation of a legendary Washington landmark, a fierce stylized eagle, carved by the Shefts brothers, looks out at the pillars of the Treasury Building.

sculptor uses his tools. What do you call Michelangelo, I said, a chiseler?"

Etched glass—the designs on which were created by applying hydrofluoric acid to glass masked with acid-resistant coatings—was very popular in 19th-century row houses and brownstones. But the use of sandblasting, a technique invented in 1870, gave the glass craftsman more flexibility. Not only did sandblasting avoid the noxious fumes of the acid method, but it allowed the craftsman greater direct control of the medium.

Sandblasting, in the hands of a master like Sam Shefts, is a modeling tool. Working from a mask made by Charles, Sam carves a view of the Capitol for the Washington restaurant. He directs the ceramic nozzle at the deepest areas first, working in overlapping planes to build up the image. Standing in front of a plywood booth, with his hands pressed through a space curtained against the swirling sand, and looking through a window, he models the folds of the statue atop the dome, then sharpens the crest of the figure's helmet. Almost imperceptibly, the glass grows frosty under the influence of finely sifted sand, scallop after scallop of carving building to a complete image. The smallest details are an eighth to a sixteenth of an inch wide, about the size of the nozzle, and by varying the pressure of the blasting from two to 40 pounds per square inch, Sam can vary the speed of the abrasion. Part of his skill is knowing just how deeply to carve. "He takes chances," says Kenn Yesmant. "Most people would go right through the glass."

Although the strength of its images sometimes belies its fragility, the Shefts' glass is still glass, and they have had pieces broken.

"It happened once on Friday the 13th," says Ike. "We had a piece for a hotel that was due to open. See, we sometimes work right up to deadlines because we only get the exact sizes after the architects and the carpenters are all finished.

"We sent the piece out and our guys must have been looking at a girl or something, because it dropped. We spent the next 40 hours doing that piece completely over without sleeping.

"It was for Sarah Lee, the hotel designer, and this time I took it down myself. When she saw us coming she ran out to meet us, she was so happy. Then she threw her arms around my neck and kissed me."

This elaborately achieved mermaid of sandblasted glass graces an entire wall of the Colonnade Seafood Restaurant in Manhasset, New York. Peach-colored glass for the mirror was special-ordered from Europe.

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Improved feather renovator, which steam-cleaned and then dried its contents while rotating, won patent for George Crum of Ladiesburg, Maryland.

By George Nelson

Patent models: big ideas in small packages

For most of the 19th century, America's inventors sent a tiny replica with every application; fortunately, they piled up

It is an ancient truism that the observer brings with him a good part of what he thinks he sees. What most of us see when confronted by a collection of patent models is a mass of fragments of a toylike world, dimensioned in this instance by government order to fit within a cube 12 inches on a side. This rule held whether the invention submitted was a clothespin or a portable fire-escape ladder.

Clothespins of seemingly endless variety and a fire-escape ladder elegantly hand-crafted of wood, cord and metal are among the 500 patent models on exhibit at the Smithsonian's Cooper-Hewitt Museum in New York City. "American Enterprise: Nineteenth-Century Patent Models," sponsored by the New York law firm of Simpson Thacher & Bartlett, opened last month and runs through April 1.

There probably never was a period when tiny replicas have failed to enchant the viewer, so it would be normal for most of us, with no aspirations to invention, to see in century-old models submitted for patents the expressions of a doll-house world and to respond to the instant, universal appeal of the miniature. Because the models are old, we can also see in them artifacts created by a vanished culture, there for all to examine for clues to what life must have been like way back then. The fact that so many thousands of these little objects, now precious and instructive mementos, have been mauled, neglected, lost in dusty files and display cases, exposed to fires and auctioned off by speculators, adds a certain pathos to the examination.

Scanning the history of these models, one is struck

Risking his good name, inventor Hiram True said that wearers of his parlor skates would perform "many graceful evolutions" and could "attain great speed."

Movable arms, legs and head of "natural-creeping baby-doll" ran on clockwork-movement body; full-size doll would wear clothes to hide its bionic innards.

by its resemblance to the tale of the sorcerer's apprentice, in which a boy is left alone in his master's laboratory and accidentally creates his own perpetual-motion machine. As it pours out its product, he realizes that he does not know the incantation needed to turn it off. In the 1830s the Patent Office turned on its almost-perpetual-motion machine by requiring that inventors submit models in addition to drawings and written descriptions. By 1880, when the requirement was dropped, the Patent Office was overflowing with models. And still the models kept coming in. After the Columbian Exposition in 1893, 155,000 remained, and in 1908 Congress finally addressed itself to the problem of their disposal. A hardy breed, this Lilliputian assemblage of crystallized ideas.

Cultural artifacts have a way of swinging wildly in the scales of public esteem. Rome's Colosseum, an inescapable artifact if ever there was one, was viewed during the Middle Ages not as a relic of the glories of the Empire to be preserved for future generations, but as a handy quarry whose stones were already cut and ready to use again. At the other extreme we have the home of the late Elvis Presley transformed into a shrine which is, incidentally, the core of a profitable business fed by the visits of a million pilgrims.

As a people, we are very *immediate*: we want what we want right now, and once tired of it we forget it. In the 19th century our now-neglected patent models were one of the major tourist magnets of Washington, D.C. Important voices were raised to inform the public that the models were there "to elevate our national character," a rather astonishing proposition when you think about it, and a very revealing one as well. The Patent Office Building was set down on the site reserved in Pierre L'Enfant's plan for a great national church. One might surmise that in the absence of such a monument, an exhibition dedicated to 100,000 patent models might be as close as we could get. There seems to be little doubt that sometime in the late 1800s God became a U.S. citizen, and so a patent model as votive offering seems appropriate.

The universal optimism that permeated the land

Photographs by Yale Joel and Kim Nielsen

then is hard to evoke in these days of doubt, and it is necessary to remind ourselves that this was indeed God's country, the biggest and best thing that ever happened. If the streets were not exactly paved with gold, at least they were getting paved; and no matter how modest our performance in this life, our children were going to do better. All we had to do was wait through a century of salt-water taffy, softball, cinder-clogged parlor cars and ice-powered refrigerators until television and computer games were finally invented.

Artifacts are remarkably clear transmitting devices, for while words can mislead and even lie, artifacts cannot. They are by their nature "on the level," and their messages, for those able to decode them, are always truthful. When we look at Abraham Lincoln's device for getting riverboats off sandbars (opposite) we see in it an entire vanished world in action: men heaving and perspiring with ropes, pulleys and winches; crew and passengers looking over the side of the mired craft, listing in its sandy trap. We can see people watching from the shore, too: men in top hats and sideburns, women in tight-waisted dresses and big bonnets. Those were the days when even near-disasters took on a holiday quality.

I picked this as a sample of a "readable" artifact in part, I am sure, because the picture of Lincoln as an inventor is hard to resist, but also because it is so obvious that the images it evokes are *not* in the invention, but in popular prints of the time, or old books, or even a film about life on the Mississippi. Because of the peculiar nature of perception, what we "see" is not necessarily what is there, but rather a series of parallel constructions made up of relevant images.

Examples of this very human blending of fact and imagination can be found everywhere. There is the marvelous story of Archimedes and his cry of "Eureka!" which has been echoing in the corridors of memory for 2,000 years. The Tyrant of Syracuse had been given a gold crown, and with the suspicion normal in an experienced ruler, he wondered if it was really made of gold or alloyed with some inferior metal. The mathematician Archimedes was called in for an answer, but unhappily there was no way to get the crown's exact volume, which he needed; its forms were too irregular. Frustrated, Archimedes went to the baths one hot afternoon, something he had been doing for years. Getting into the tub this time, however, he saw for the first time that the volume of water displaced was always exactly the same as the volume of his body. Later, putting the crown in a vessel full of water, he caught the overflow in a measuring cup, which gave him the

The author, a designer who trained as an architect, wrote George Nelson on Design. *This article is adapted from his essay for the exhibition catalog.*

Real eggs in foreground emphasize the small scale in which a Blue Earth City, Minnesota, inventor built patent model, precursor of today's egg carton.

Small-scale patent model for a naval gun carriage that would lessen the shock of recoil is made of finely machined, movable parts.

One of many 19th-century patent models related to railroad problems, Andrew Cathcart's illustrates an improvement in locomotives for going uphill.

Clever solution to the problem of untimely ship sinkings was Albro's life-saving Ship Bed, with minimattresses doubling as life preservers.

Numerous clothespin models attest to widespread problem of "clothes being blown away or falling to the ground."

Like the pivot gun (opposite), this rotary press patent model invites close inspection of miniature components.

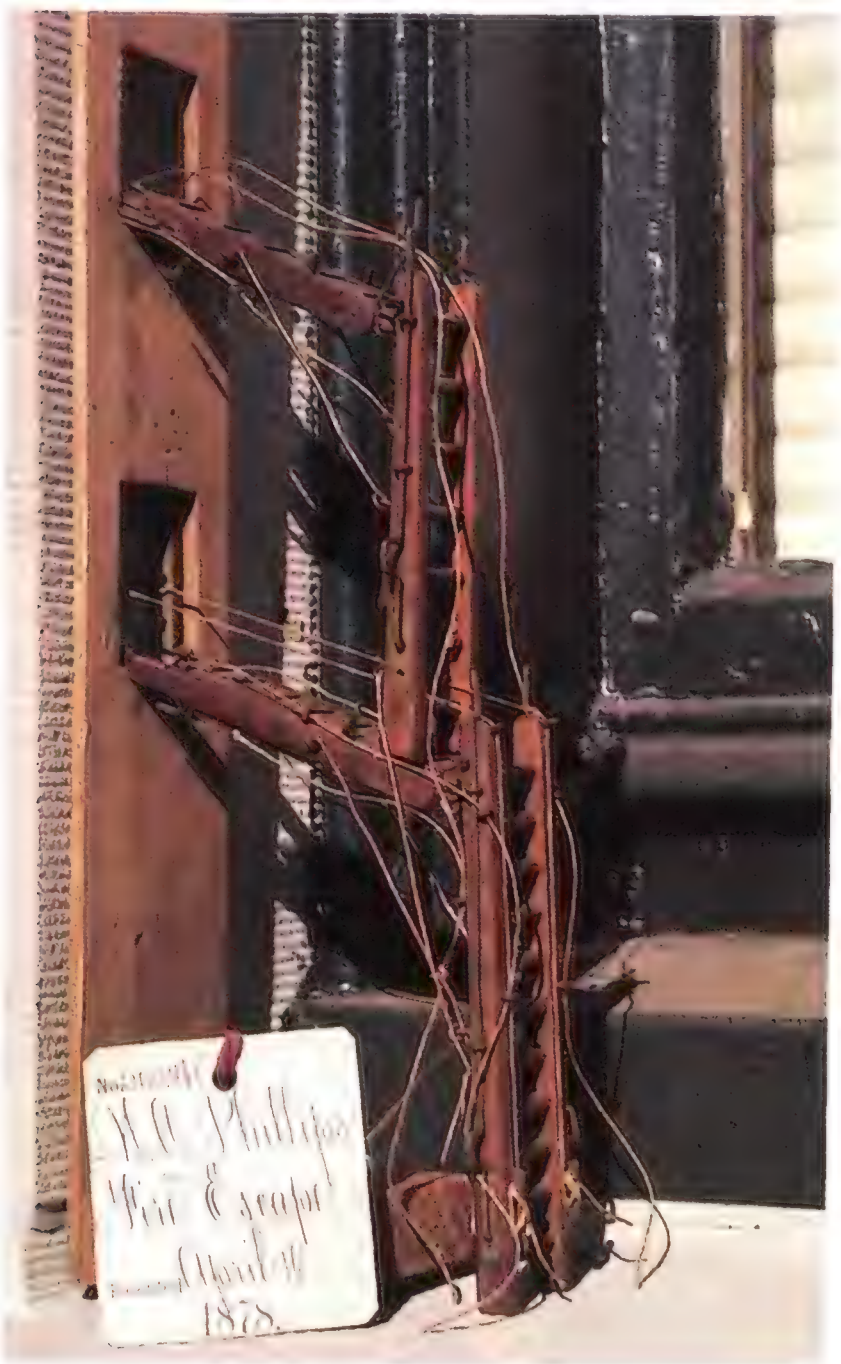
Abe Lincoln patented air chambers attached to steamboats; when pressed down, they lifted boats off sandbars.

Removal of bed-bug trap from head of mattress, then hard tapping, dislodged fugitives.

In floating safe, at least your stocks and jewels would survive shipwreck.

Kitchen cabinet has cutaway sides, depriving pests of hiding places.

Improved pigeon starter, patented in 1875, had a mechanism "to enable it to be set in a crouching position, and to be sprung into an erect position."



Tiny scale of this elegantly constructed portable fire-escape model is evident when its windows are compared with their counterpart in background.

precise volume of the crown. Comparing this with the amount of water displaced by an equivalent weight of gold, he got his answer.

All major inventions must follow the pattern of Archimedes' great discovery. Whether the procedure is contrived or, like the discovery of vulcanized rubber, accidental, the pattern does not seem to vary greatly. What does vary is the scale and quality of the idea. Archimedes achieved an extraordinary insight into nature's workings, applicable from then on to any number of situations. The Yankee inventors, however, almost invariably homed in on small, localized problems: an improvement to an egg-packing box, a new variation on a creeping doll, a "pigeon-starter" cat (left) that produces the desired effect by springing upright from a crouching position.

What is really fascinating about many of these pieces are the ideas themselves. Some sweep the observer past the limits of credibility, while others make a lot of sense. Ready for service in all beds, folding or rigid, there is a handy "bed-bug trap" (p. 123). This consists of a frame equal in size to the mattress and covered with willow or rattan braiding. "The nature of the bug being to crawl into crevices," wrote its inventor, William Tapper of New York City, "they will naturally go to this frame, offering, from the manner of its construction, innumerable creep-holes." Each morning one simply removed the frame "carefully" and pounded it against the floor, dislodging the doomed interlopers. Though it may not have worked to protect the sleeper, the bed-bug trap does at least indicate something about general living conditions. A more promising antibug patent model—a kitchen cabinet with tilt-out drawers and cutaway sides (p. 123)—exposed the furtive creatures' favorite nooks and crannies to the harsh reality of the washrag. (This makes more sense than leaving the kitchen lights on all the time, a practice sometimes resorted to these days by desperate high-rise dwellers in New York.)

Hybrid inventions from ingenious minds

At the farthest limits of credibility is the "parlor-skate" (p. 121), which, with its "single transporting wheel," enabled the wearer to "perform many graceful evolutions" and to "avoid collisions in a crowded rink." One can only study the model and wonder at the imagined scene.

Many strange "hybrids" were concocted for patent approval—a combination doorbell-and-burglar alarm; a box that opened up into a bed, table, chair, bureau and commode; a ship's bed with sectional waterproof minimattresses (p. 123) that could be grabbed on the run and fastened over the shoulders for quick night-time exits. It is just possible that many of the hybrids

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were created by inventors who were simply having a ball thinking up problems calling for ingenuity. Such challenges may have been a major motivating force in the entire process of invention. One of the oddest assumptions held by all too many people in our supposedly rational society is that no one ever does anything just for the hell of it; that beyond money and a rise in social status there are no possible reasons for working at anything. Life is meant to be lived, not sold or rented in conveniently packaged fragments.

What I get out of these models is not so much that they are now obsolete in a world where technology has moved on, so that they survive as curious examples of folk art, although this is true. Nor is it that, as cultural artifacts, they are as valuable as Indian arrowheads and Neanderthal flints, with much to tell us about the forms of a life that has changed beyond recognition, and not always for the better. No, the thing that comes through for me is the still undiluted magic of the creative effort at any level, the feeling that one's efforts are going to benefit one's fellow, the simple joy of taking an idea into one's hands and giving it proper form.

This is the point at which professional skill and amateur fumbling come out as essentially the same thing, and it may be one of the oldest existing manifestations of our common humanity, as old as the touching little "Venus of Willendorf" or the superb cave paintings of Lascaux and Altamira. Only this time around it is patent models, and they should be regarded with the same delight and respect.

Many back-shed tinkerers of 19th-century America put in long nights on the popular category below. Improvements included, from left: a velocipede with a seat "shaped like a lady's saddle" (which means a sidesaddle complete with stirrup); a bike operated by rod-mounted pedals; and a streamlined tricycle.

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JAGUAR XJ-S.

Pepper berries must be picked while green, and dried until they turn black, before grinding into pepper.

By Robert Wernick

Men launched 1,000 ships in search of the dark condiment

When it came to drawing explorers into the great unknown, the lure of pepper was as strong as the yen for gold or glory

Pepper harvest, on Malabar coast of India, was depicted in this 14th-century miniature, based on

"The passion for pepper seemed to burn like a flame of love in the breast of Dutch and English adventurers about the time of James the First. Where wouldn't they go for pepper! For a bag of pepper they would cut each other's throats without hesitation, and would forswear their souls, of which they were so careful otherwise; the bizarre obstinacy of that desire made them defy death in a thousand shapes—the unknown seas, the loathsome and strange diseases, wounds, captivity, hunger, pestilence and despair. . . . They left their bones to lie bleaching on distant shores, so that wealth might flow to the living at home."

So muses Conrad's narrator, Marlow, in Chapter 22 of *Lord Jim*. Lord Jim himself was to add his bones to the rest, in his dark, doomed corner of the East. And all for a few handfuls of what, in Conrad's time as in our own, was nothing more than a powdered condiment to be found on every table, to be flicked carelessly on every humdrum meal. What in the world, Conrad or you or I might wonder, could be so extra-

a detailed description made by Marco Polo in 1298, shortly after he came back from traveling to the Indies.

ordinary about pepper that men willingly died for it?

But if you enlarge your historical horizon a bit, and look back just a few centuries, there is nothing at all bizarre about the obstinacy of those pepper seekers. They were dealing with one of the great motive forces of human events. Closely examine any of the great crises that have shaped the world as we know it—the fall of Rome, the Crusades, the discovery of America—and often as not you will find a pungent smell of pepper at its core.

When Alaric the Visigoth held the city of Rome to ransom in A.D. 408, he demanded and got five thousand pounds of gold, 30 thousand of silver; 4,000 silk tunics and three thousand pounds of pepper.

There are people in the spice trade who will tell you that Alaric wanted the pepper to put in his sausages—a recent invention of the Visigothic horsemen that enabled them to travel great distances with a relatively well-preserved supply of meat. But the early history of sausage is murky; it is more likely that Alaric wanted

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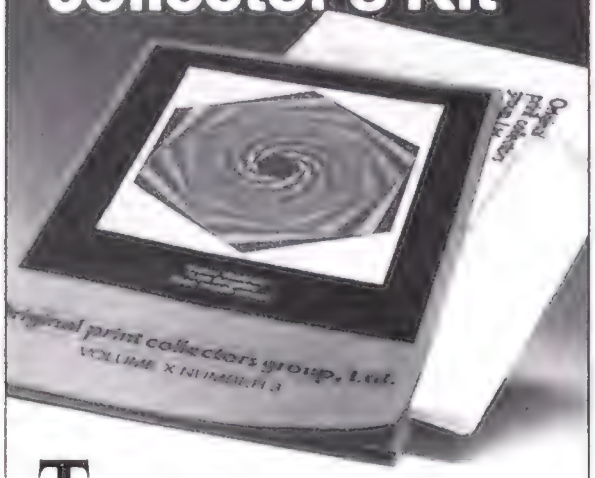

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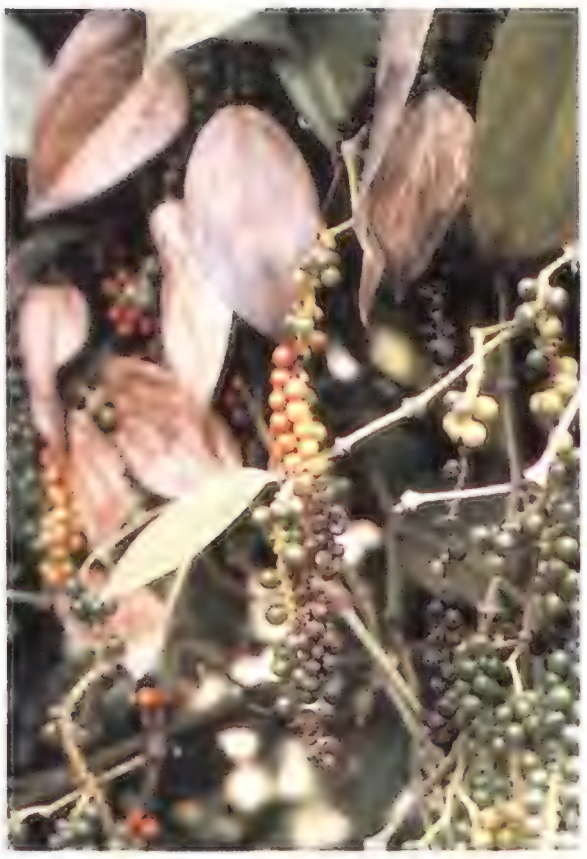

To produce white pepper, *Piper nigrum* berries have to be ripened until they turn orange.

pepper because it was small in bulk, light in weight and enormously valuable. The Romans, like the Greeks before them, were wild about pepper, which they imported at great expense from the East. Pliny the Elder chided them for exchanging precious metal for a product that grew like a weed in its homeland. But they went on paying out their gold and silver. First they paid it to Arabian middlemen. When they learned that it grew in India, they discovered how to use the monsoon winds to sail regularly back and forth between the Red Sea ports and the Malabar coast, and it became one of their principal trade routes. An old Sanskrit text records how their traders "came with gold and returned with pepper and Muziris resounded with the noise."

The duty levied on that pepper in the customhouses of Alexandria was one of the mainstays of the Imperial budget. And all that gold flowing to

Robert Wernick has lately written for SMITHSONIAN *about such things as goats and the University of Texas.*

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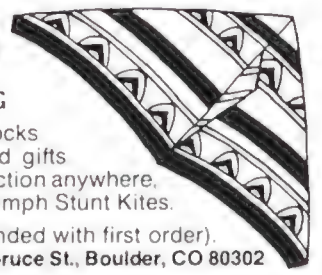

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Muziris and the other ports of India deepened the deficit in the balance of payments which, according to one school of modern historians, led to the financial crisis that helped destroy the Roman Empire.

It wasn't pepper alone, of course. Other luxury goods in the East were attracting Roman gold: pearls and ivory and apes and peacocks and such. And there were dozens of other spices, like nutmeg and cinnamon and cloves and cardamom. For that matter there were at least 20 other plants of the genus *Piper* growing wild in India. But black pepper, *Piper nigrum*, was always everybody's favorite and has always provided the bulk of the spice trade.

After Rome fell, pepper became much rarer and more expensive in the Western world. Wars and invasions made trading hazardous. Then the rise of Islam turned the Mediterranean into a Muslim lake closed to European shipping, and the regular trade routes to the Orient almost dried up. Every so often pepper turns up in an ancient document: an emperor gives a pouch of it to a favorite monastery; King Ethelred the Unready demands a tribute of so many pounds of pepper every Christmas from the German merchants in London; the Venerable Bede leaves what he holds most precious, his pepper and his love, to the Benedictine monks among whom he lived. But in general the Dark Ages of Europe were the Pepperless Ages as well, in which many people found little better to flavor their food than onion, garlic and a few other herbs.

This was a grievous burden on the people of northern Europe—and particularly for the upper classes—who were heavy meat eaters. At the time meat, if preserved at all, was preserved by drying and salting, so that without pepper to liven up or otherwise disguise the taste or the rancidity, it was dreary on the tongue.

The flow of pepper to Europe increased again as a result of an eco-

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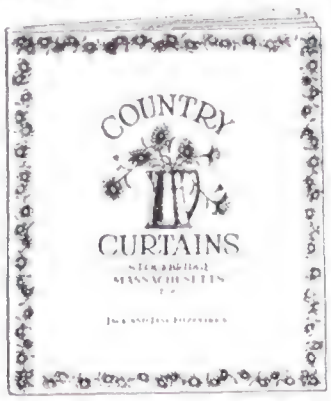

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nomic and commercial boom that began at the end of the 11th century. When the beefy barons of the North, sailing to the Holy Land on the Crusades, found pepper in the Near East—one of the most notable features of the boom—they went crazy over it. The eating habits of a continent were changed almost overnight. Garlic and onions were reduced to the relatively plebeian status they still hold. Pepper was the thing for any man who valued his social position. "He hath no pepper" was a phrase used in the Middle Ages to describe a real nobody.

A pound of pepper in those days was worth, roughly, one sheep. Pepper was used for dowries, for taxes, to pay off soldiers—every member of the Genoese army which captured Caesarea in 1101 got two pounds of pepper as a reward. Judges were bribed with it, rents were paid with it, city accounts in the ledger books were calculated in peppercorns. In the Middle Ages Guillaume de Limoges complained about the insolent display of wealth by a rich commoner who piled peppercorns in his storerooms "as if they were so many acorns for his pigs." Benefactors used to demand a symbolic yearly payment in pepper when they endowed a church: Queen Elizabeth II, visiting her revolted colonies in 1976, was presented with 279 peppercorns at Trinity Church on Broadway, representing back rent due since the days of William III.

The pepper which came to Europe in the Middle Ages mostly came in the fleet that served Venice, the Queen of the Adriatic. When in 1499 Vasco da Gama came sailing back to Lisbon with pepper in his hold that he could sell for a fraction of the price the Venetians had to pay their suppliers, the Queen's throne tottered. "All the city remained stupefied," wrote a Venetian in his diary; "the wisest held it for the worst news that could reach them." They knew that the mastery of world trade was moving west, to the North Atlantic.

Vasco da Gama was a Portuguese. Why was it that Portugal, and later Spain, Holland, England and France, seized the scepter from Venice? This, the eminent French historian Fer-

Christopher Columbus, shown with distracting sirens and sea-gods, reported finding "an infinity of spices," including pepper, but was sadly mistaken.

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nand Braudel maintains, is one of the central questions of modern history. How did it happen that the relatively obscure and underdeveloped little nations of northwestern Europe, which had long been on the outer fringes of civilization, in the space of a century or so reached out to colonize such chunks of the globe? How did it happen that little fog-bound England, with a population no bigger than Connecticut's today, could send its ships 10,000 miles to India, while not a single ship of the mighty Mogul empire ever sailed into English waters?

The obvious answer would seem to be that the Europeans had better ships. Not necessarily. The Arabs, the Indians and the Chinese had long seafaring traditions; Sinbad the Sailor was not an Englishman. In the 16th century the Chinese had huge seagoing junks, as big or bigger than any European sailing ship that had been built at that time. The difference between East and West was that only the Westerners had any seri-

In 1499, Vasco da Gama helped turn Portugal into a world power by bringing home a trove of pepper from India.

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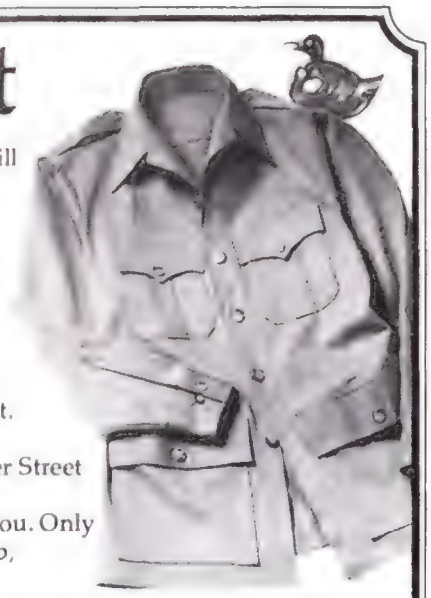

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Pepper is actually a vine that can grow to about twice a man's height.

ous reasons for deep-sea navigation.

The Asians had everything they wanted in reach of coastal sailing; they rarely had to get out of sight of land. For the Europeans, on the other hand, the things they desperately wanted, the pearls and the pepper, were in distant lands, available only through grasping middlemen. The rewards were so great it was worth making any effort to get at the source, even if it meant sailing to the edge of the world.

Every one of the great explorers of the great age of discovery—Columbus, Magellan, Amerigo Vespucci, John Cabot—was looking for the 7,448 Spice Islands that Marco Polo had reported lying off the coast of Cathay. (We now know them as the Moluccas, just west of New Guinea.)

Columbus was sniffing for pepper wherever he went. He had an amateur botanist with him on his second voyage, and one of the first things the botanist did was notice that the natives used a spice called *agi* to

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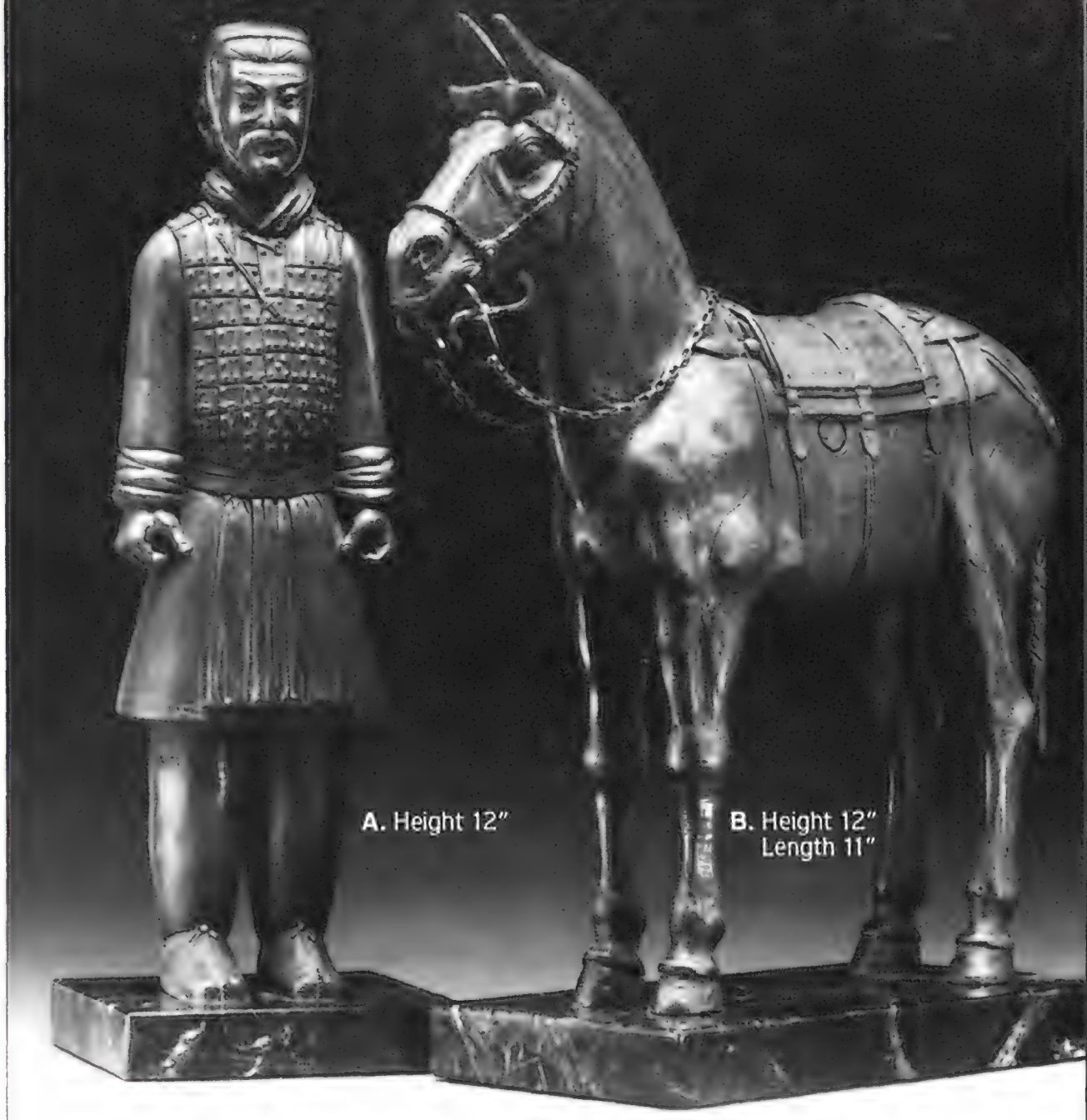
Usually it is supported by orderly rows of stakes, as on this Paraguayan plantation.

season their meals. The plant was undoubtedly one of many West Indian hot peppers. Columbus duly dispatched some to Cadiz. The tasters there, more realistic, reported that the taste was indeed strong "but not with the flavor of that of the Levant." Eventually explorers in the New World would also discover dozens of varieties of peppery plants belonging to the genus *Capsicum*: sweet bell peppers, paprika, jalapeños, cayenne peppers, the Bahamian peppers which set the mouth on fire—all of which have in common that they are not related to black pepper at all.

While Columbus was imposing this delusion on his patrons, other explorers beating their way around Africa in the early 16th century had at last found their way to the true source of pepper: the Malabar coast and Sumatra. The prizes were enormous. Later, when the Dutch wrested Sumatra from the Portuguese, tiny Holland, virtually a collection of mudflats, became for a while one of

From the Incredible Buried Army of the First Emperor of China!



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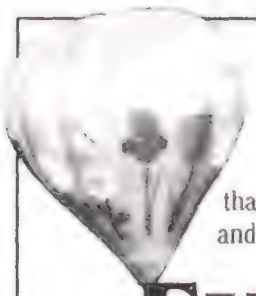

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A 1700 map shows rich pepper sites in India and Dutch East Indies.

the richest and most powerful nations in the world. The East India Company, which was eventually to acquire India for the British Crown, came into being to defend English interests the day the Dutch greedily jacked up the price of pepper from three shillings a pound to eight.

The pepper trade has always been marked by a strong tendency to keep producer and consumer as far apart as possible. The Arabians, who controlled the trade in antiquity, told the Romans pepper grew only under waterfalls guarded by dragons. Venetian traders called peppercorns "seeds of paradise," as a selling point to make their customers believe that they had dropped from the sky. The Dutch did their best to keep the location of the pepper-growing regions a secret, until in 1795 the secret was pierced by a Yankee skipper from Salem, Massachusetts, who brought a cargo back that made a 700 percent profit on the voyage. He couldn't

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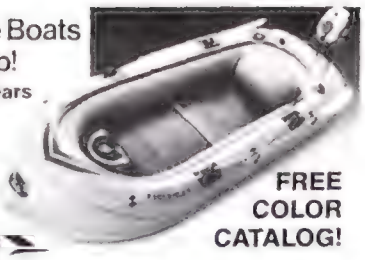

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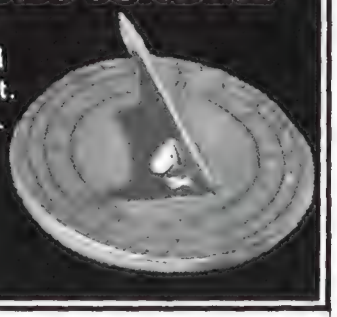

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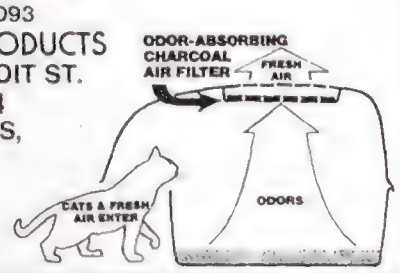

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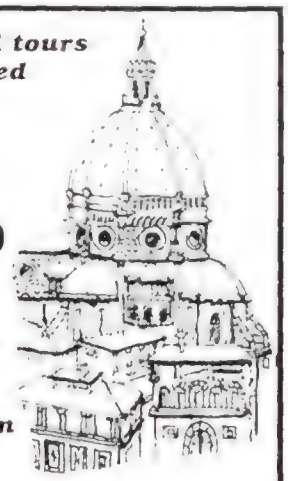

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keep the secret either, and soon whole fleets were braving the reefs and pirates of Sumatra to bring tons of pepper back to Massachusetts. It was one of the vital steps in establishing the preeminence of the merchant marine of the young Republic.

Bones do not bleach for pepper as they once did. The perils and romance of the spice trade are largely a thing of the past. It has been a long time since stevedores unloading pepper ships were forbidden to have pockets in their clothes. Yet there are still parts of the world where pepper is regarded as a more reliable currency than the local bank notes. In Sarawak, Chinese merchants sleep with five-pound bags of pepper under their pillows the way French peasants once sewed gold napoléons into their mattresses.

Only a few years ago the arrival of a ship with a cargo of pepper was an exotic delight at any Occidental port. Agents of the importers would insert steel probes through the mesh of the burlap bags to pull out samples, and the redolence of the Orient would suffuse the dock. Tom Burns, who runs the American Spice Trade Association, used to sample spices on the docks as a young man, and he remembers how the aroma suffused his clothes, and the subway back to Brooklyn; when his children opened the door for him at home, he brought all the mysterious East in with him. Nowadays, pepper comes in anonymous sealed containers, and even the factories where they grind the spices have been forced by government agencies to suppress the odors.

There is no longer any mystery about where pepper comes from, though the head of a large American spice-importing company was heard to ask not long ago: "Where the hell is Sarawak?"

A part of northwest Borneo, Sarawak was once ruled by an English rajah. It became an important pepper producer when huge plantations were created by Chinese merchants in the

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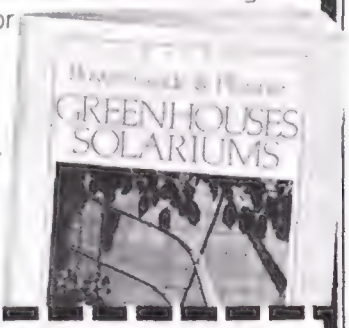

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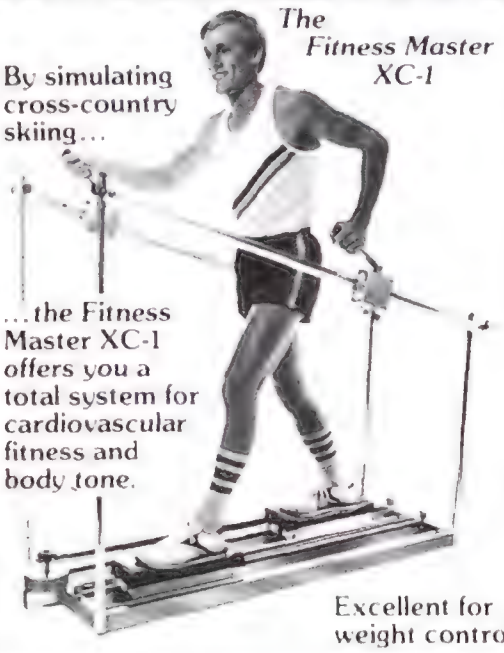

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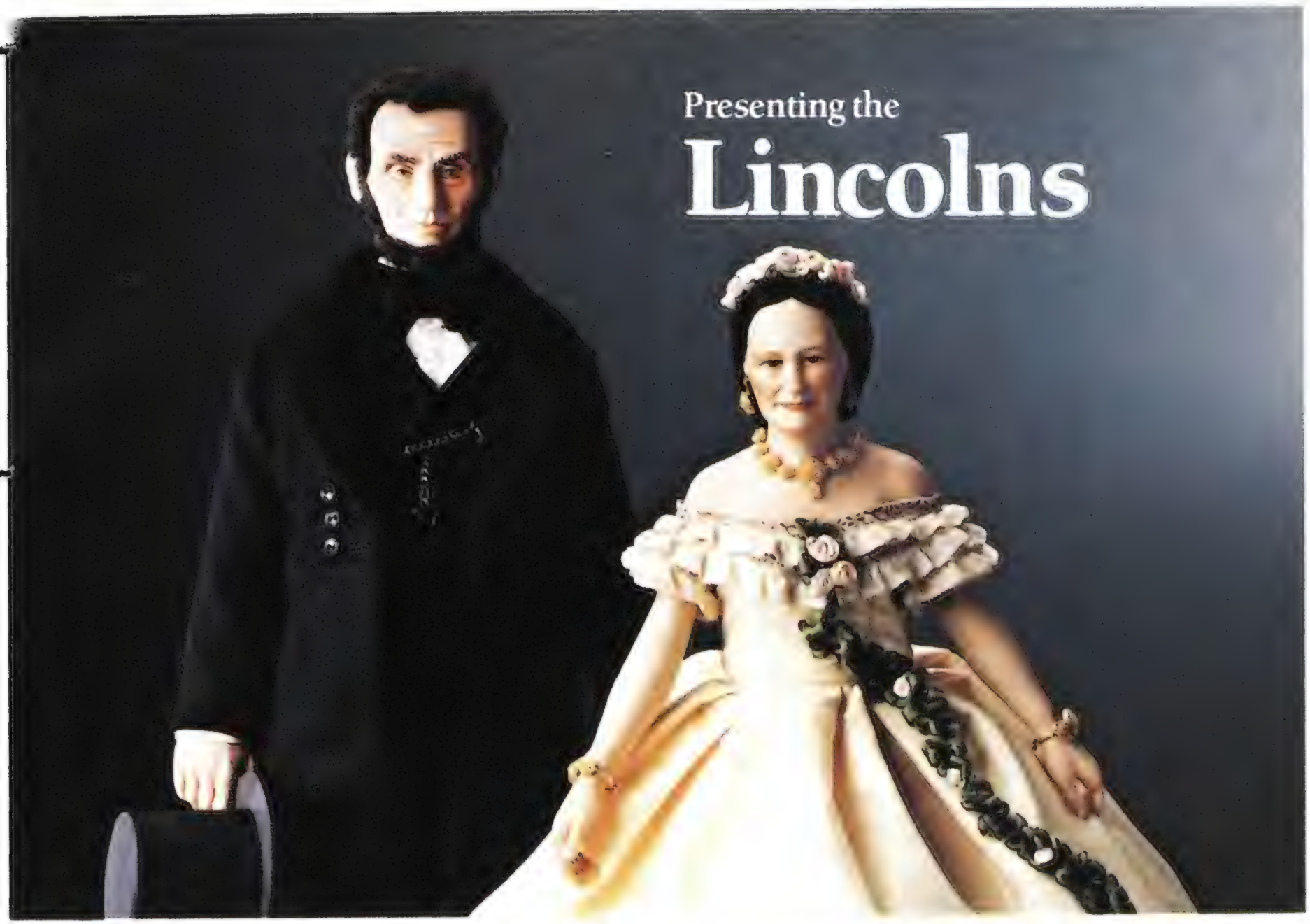
years following World War II. About the same time, Japanese immigrants who had smuggled cuttings out of the Orient were starting plantations up the Amazon in Brazil. In the traditional growing areas of the Malabar coast and Sumatra, production is generally in small family plots.

Each of the four main producing nations—Malaysia, Brazil, India, Indonesia—exports from 30 to 50 thousand tons of pepper a year. Together with Sri Lanka, they have formed an International Pepper Community, which is responsible for virtually all of the world's commercial output, and which has periodic visions of making fortunes for itself the way OPEC did. The visions are idle: all these nations are in desperate need of foreign currency and unable to hold any artificial price line. At a recent IPC meeting at Belém in Brazil they agreed to fix a higher price, and within 48 hours there was an announcement of a price cut—from Brazil. No one has ever succeeded in establishing a pepper monopoly; the last one who made the attempt was an English speculator who tried to corner the market in the late 1930s. He reckoned without the fact that huge quantities of pepper are always being hoarded, for a variety of reasons. It is easy to hoard because peppercorns, unlike other foodstuffs, will last indefinitely: put them in a warehouse for a hundred years and they will lose only an infinitesimal part of their weight, and none of their pungency.

Hoarded supplies coming on the market not only ruined the Englishman, they drove the world price down to a ruinous four cents a pound in 1939. During World War II, the Japanese tore up all the pepper vines on Sumatra to plant rubber and food crops, but there were enough stocks on hand to keep the price from rising astronomically. It went up to $2.65 a pound in 1950. Today it is about a

Paying back rent in pepper—one peppercorn a year as stipulated by a 1697 agreement—the rector of New York's Trinity Church hands Queen Elizabeth 279 peppercorns during Queen's Bicentennial visit to this country in 1976.



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The barbarian king Alaric briefly enjoyed Rome after his army took it, but in A.D. 408 he gave the city back for a ransom that included 3,000 pounds of pepper.

dollar. It is hard to think of cost, though, when so little of it goes so far. An ounce of pepper will, according to the most up-to-date calculations, season 1,440 eggs.

Consumption of pepper in the United States has been rising steadily from 14 thousand tons a year in 1950 to 30 thousand today. This is partly a matter of changing lifestyles. People eat in restaurants more, and there is always a pepper shaker, or the currently more fashionable pepper mill, there. More meals are served in institutionalized settings, where diners are usually handed little packages of pepper which count statistically as "consumption" even if they are thrown away.

It is a matter of demography. In 1950 the population mix was heavily skewed toward babies, and babies don't like pepper. Neither do animals. You will find no pepper in infant formulas or in pet food. A taste for pepper is part of the maturing process; it comes at about the time the average youngster takes his or her first meal at Burger King.

Pepper tastes the same at Burger King or the Ritz. It is always the same old pepper. Vines growing in different soils produce berries with different degrees of pungency, but by the time it is mixed with food there is no way to tell the difference. Anyone who says you should have used Tellicherry instead of Lampong in your stew is not only an odious snob, but doesn't know what he is talking about. Of course it is best when freshly ground; depending on the fineness of the grind, powdered pepper loses its taste in a few months.

All true pepper is the dried fruit of the *Piper nigrum*, a woody vine trained to grow around trees or stakes to a height of about ten feet. It grows only in tropical regions with about 100 inches of rainfall a year alternating with long periods of dry heat. The vine sends out spikelike stems about four to five inches long which bear tiny yellow-green flowers and then 50 to 60 peppercorns. Picked when they are green and left to dry and turn dark in the sun, these make black pepper. Allowed to ripen some extra weeks and with the husks washed off, they make white pepper.

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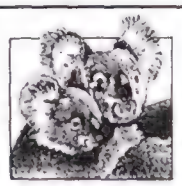

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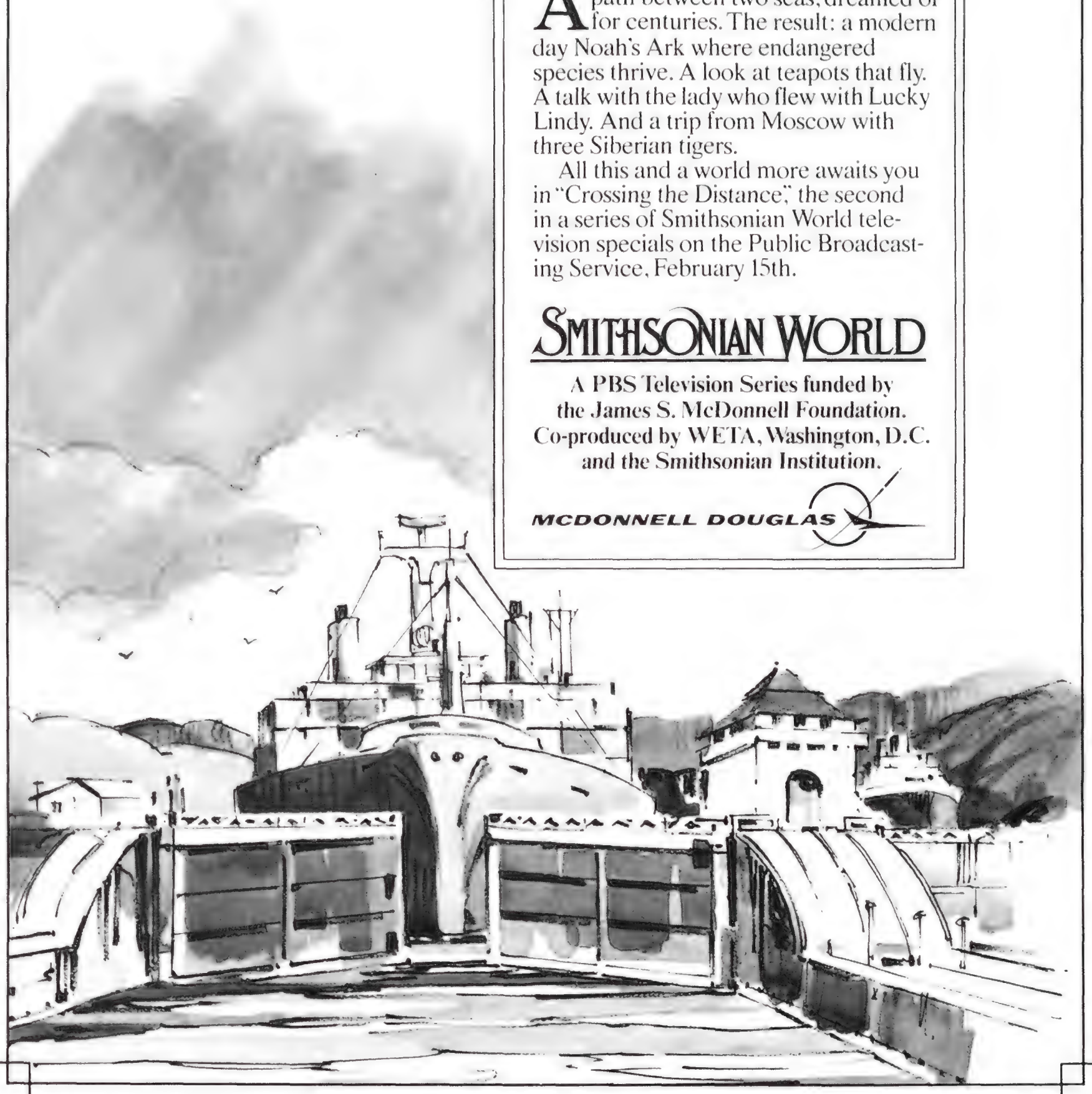

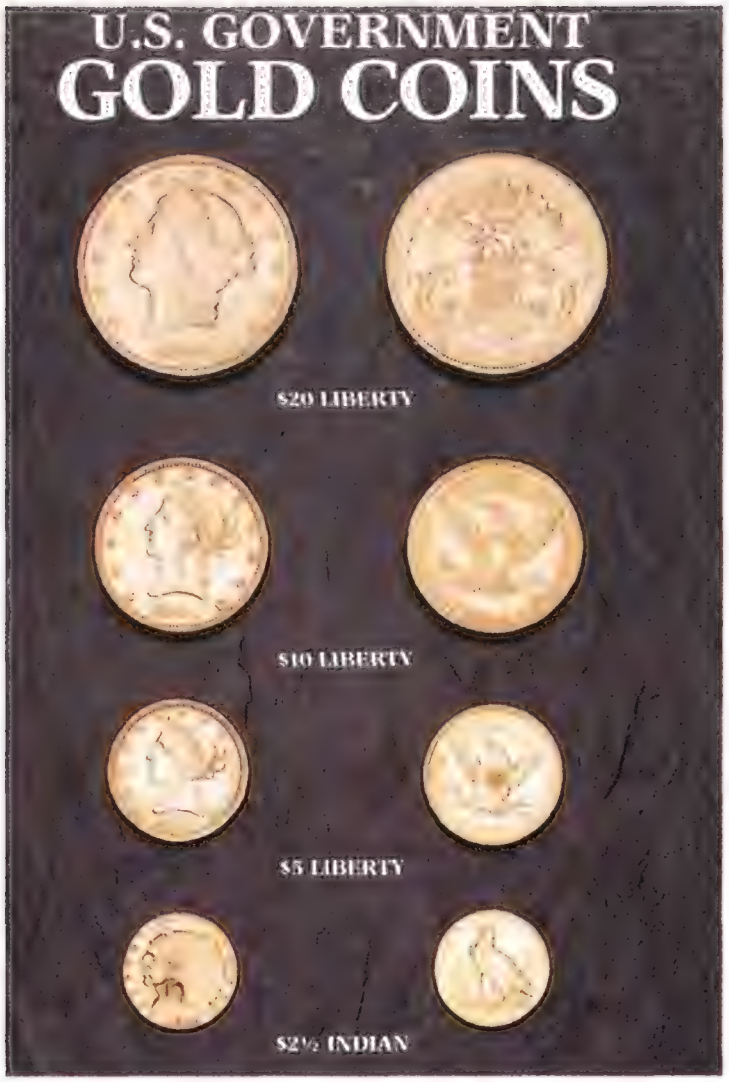

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sharp taste and smell of pepper. English cooks, the least adventurous in the world, tend to use white pepper. In the 19th century they got used to adulterated varieties. When a shipment of genuine pepper got sent out by mistake, it was generally sent back because it was too strong. But those days are happily past.

Dogs bark, the caravan passes. True pepper, *Piper nigrum*, goes on its way, the universal condiment. Unlike other spices which go with certain varieties of foodstuffs, pepper goes with everything. Tom Burns, an indefatigable traveler, has sprinkled it on everything from tiger chops to vanilla ice cream, and it has enhanced the flavor of everything. The Russians even sprinkle it on vodka.

One reason for its versatility is its unobtrusiveness. Except in a few dishes like *steak au poivre*, supposedly invented one afternoon in the 1830s by Leopold I, King of the Belgians, pepper does not force itself on you. It never takes over a dish, but blends quietly in, reinforcing other tastes. It stimulates the saliva and the gastric juices, whips up jaded appetites, contributes to a general feeling of contentment, gives you a little pep—a word whose etymology need pose no problems. The same might indeed be said of wine—has indeed been said by 10,000 bards plucking their lyres. But no one has ever written an ode, or even a sonnet, to pepper. The most you will find in the anthologies is this fragment by John Heywood in sprightly Elizabethan style:

> Pepper is blacke
> And hath a good smacke
> And every man doth it bye.

An early Sanskrit medical text recommends pepper for fever, piles and dyspepsia. Medieval Muslim physicians described it as a "deobstruent," "resolvent," "alexipharmic," "diuretic," "emmenagogic" and a stimulant in the case of snakebite. An old English doctor wrote it "causeth to snese and to clense the brayne of flewmatyke humours as snyvell and rewme."

Think how much snivel and rheum you will be cleaning out with the 60 teaspoons you will be consuming this year (assuming you are an Average American Consumer). Probably more next year, for the doctors nowadays are trying to scare everyone away from salt. And if there's no salt to flavor their dishes, where can people turn but to pepper, an ancient condiment not to be sneezed at?

Modern pepper mills at rest and at work (right), churning out some of the 60 million pounds of pepper Americans use on their food each year.

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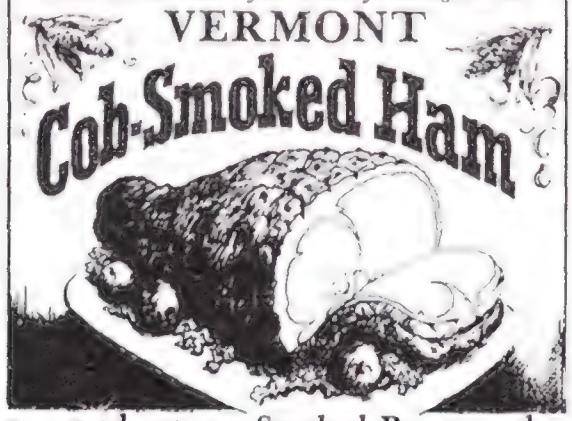

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Book reviews

The Way of the Animal Powers
Vol. 1 of *Historical Atlas of World Mythology*
Joseph Campbell
Harper & Row, $75

No one can accuse Joseph Campbell of timidity. In the course of his long and distinguished career as a historian of religion, Campbell has written more than a dozen books on subjects ranging from the art of South Asia to the symbolism of *Finnegans Wake*. His principal ambition, though, has been to chart the hidden terrain of the human mind as it reveals itself through mythic symbols. Drawing upon a rich tradition of European thought that produced such scholars as C. G. Jung and Mircea Eliade, Campbell has attempted to distill from Western and non-Western myths a series of universal symbolic archetypes that form part of the psychological baggage of all human beings.

In his search for human symbolic universals, Campbell boldly jumps from continent to continent, millennium to millennium. One moment he is looking at drawings in a Paleolithic cave, the next, poring over a Vedic text. This hyperactive erudition dazzles many readers, and Campbell's books have attracted a wide and loyal following. Others find his relentless search for universal symbols a trifle numbing. Although it is impressive to see a dozen cultures pureed in Campbell's intellectual Cuisinart, one may be left wondering how much he really knows about the raw ingredients.

These virtues and vices are evident in *The Way of the Animal Powers*, in which

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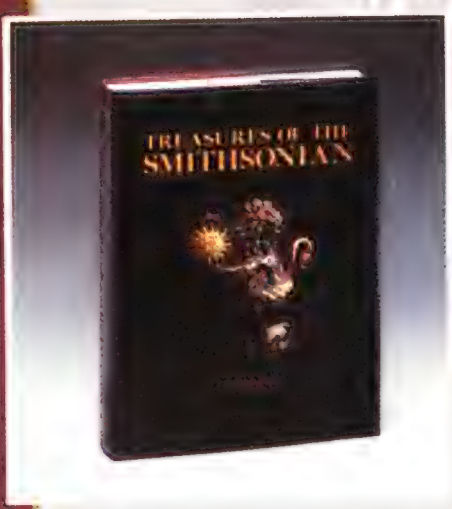

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P01

Campbell examines the religions and mythologies of the hunting-and-gathering cultures of the world. Never one to resist an opportunity to begin at the beginning, the author speculates on "the awakening of awe," the origins of consciousness, which he thinks began with the recognition of death. We trace the movements of our hominid ancestors, see them develop more sophisticated tools and forms of artistic expression, and accompany them as they initiate their children into the mysteries of the hunting cult.

But Campbell's main interest is in the recent representatives of the hunting way of life—groups such as the San, or Bushmen, of the Kalahari Desert, the Pygmies of the Ituri Forest, the Inuit of the Arctic regions, and the Indians of the American Plains. He introduces us to their views of the world and in particular to their attitudes toward the animals upon which they depend for survival.

What is Campbell trying to get at with this survey of the people anthropologists used to call "our contemporary ancestors"? Apparently he wants to show that

Niska wooden headdress from British Columbia is carved to represent the sun.

despite the contingencies of time, space and history, hunters everywhere have confronted similar existential problems and in many cases have arrived at remarkably similar solutions. Shamans—people who have the power to establish direct contact with the spirit world—are found in many hunting societies, and Campbell rummages through the ethnographic record to turn up examples of identical shamanistic practices in widely separated places. Certain mythic themes also enjoy a wide distribution: the trickster motif, stories of a time when women dominated men, and accounts explaining the origin of death—to name but a few. Campbell deftly explores the ways in which these themes are transformed to suit the unique circumstances of each society.

By the end of the book we feel intimately acquainted with the way hunters envision their universe. Yet Campbell waffles on the question of why hunters share so many mythic concerns. Sometimes he implies that myths come from a common stock of unconscious archetypes. At other points he argues that the themes originate in one place and diffuse to another. Indeed, the text contains several maps of myth-motif diffusion that are quaintly reminiscent of 19th-century anthropology.

Even more unsettling is Campbell's sometimes casual treatment of scientific fact. He tells us, for instance, that *Homo erectus* populations crossed the Bering Strait (they didn't), that the Mississippian

mound-builders were influenced by Mexican high cultures (they weren't), and that human beings fall into five distinct races (they don't).

Fortunately, some of these flaws are redeemed by the book's magnificent illustrations. The author has chosen his images carefully, using a judicious mix of contemporary ethnographic photographs, plates from early anthropological accounts, and beautifully photographed artifacts that help to bring the abstractions of the hunter's world view down-to-earth.

As a visual introduction to the life and thought of hunters and gatherers, this book has few peers. And it is to Campbell's credit that he leaves ample room for his hunters and gatherers to speak for themselves through their myths and rituals. Regardless of how one feels about Campbell's romantic search for our psychic origins in these societies, one cannot leave the book without sharing his keen sense of loss at their passing.

Michael F. Brown
Assistant professor of anthropology
Williams College

The Complete Lyrics of Cole Porter
Edited by Robert Kimball
Knopf, $30

At 14, Cole Porter left "that lazy hazy crazy Wabash River," as he called it in "Lima" (Indiana), and moved from Worcester Academy to Yale to Harvard to Paris to Venice to New York to Hollywood, with only occasional visits back home. When Indiana turns up in his lyrics, it is a boondocks joke ("We'll have a slick life/Leading a hick life/Out in a one-horse town"); yet he kept his ties to his birthplace—Peru, Indiana—to his supportive mother and to the Candy Kitchen, which regularly shipped him the fudge he loved. There is a nice irony in the image of the Hoosier boy seen dimly through the man who, with Noel Coward, has come to represent the brittle sophistication of the 1920s, which managed to survive, in song at least, the Depression, the Second World War, and the troubled post-war years.

It is the playboy, rich through inheritance and marriage, and the restless world traveler who are most visible in the Porter biographies. He had great courage, facing the pain that plagued him from his crippling accident in 1937 (a horse threw him and he was lame for life) until his death in 1964. And he was industrious always (he wrote more than 800 songs), but the biographies manage to make him seem a trivial person, skating on the surface of life in the company of Elsa Maxwell, Lady Mendl and the other fake celebrities who make reading about Porter so tedious. Those names are likely to turn up in his lyrics—what is a friend for?—but *The Complete Lyrics of Cole Porter* has more substance than that. It is a chronological journey through his lyrics from his first college songs (circa 1909) to his last show, the television special *Aladdin* (1958). The lyrics and Robert Kimball's notes tell the story of his career.

The changes in his work lie primarily in a tendency to simplify. His rhymes remained tricky to the end, but he moved away from strained elaborations. His intoxication with internal rhyme never wore off, but there is an appreciable dif-

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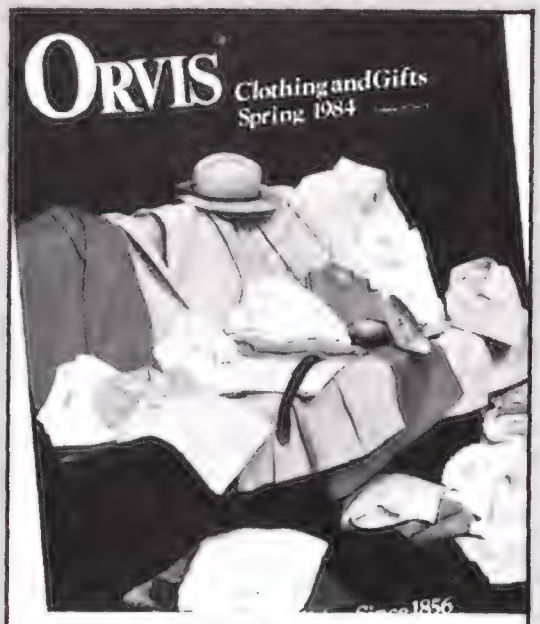

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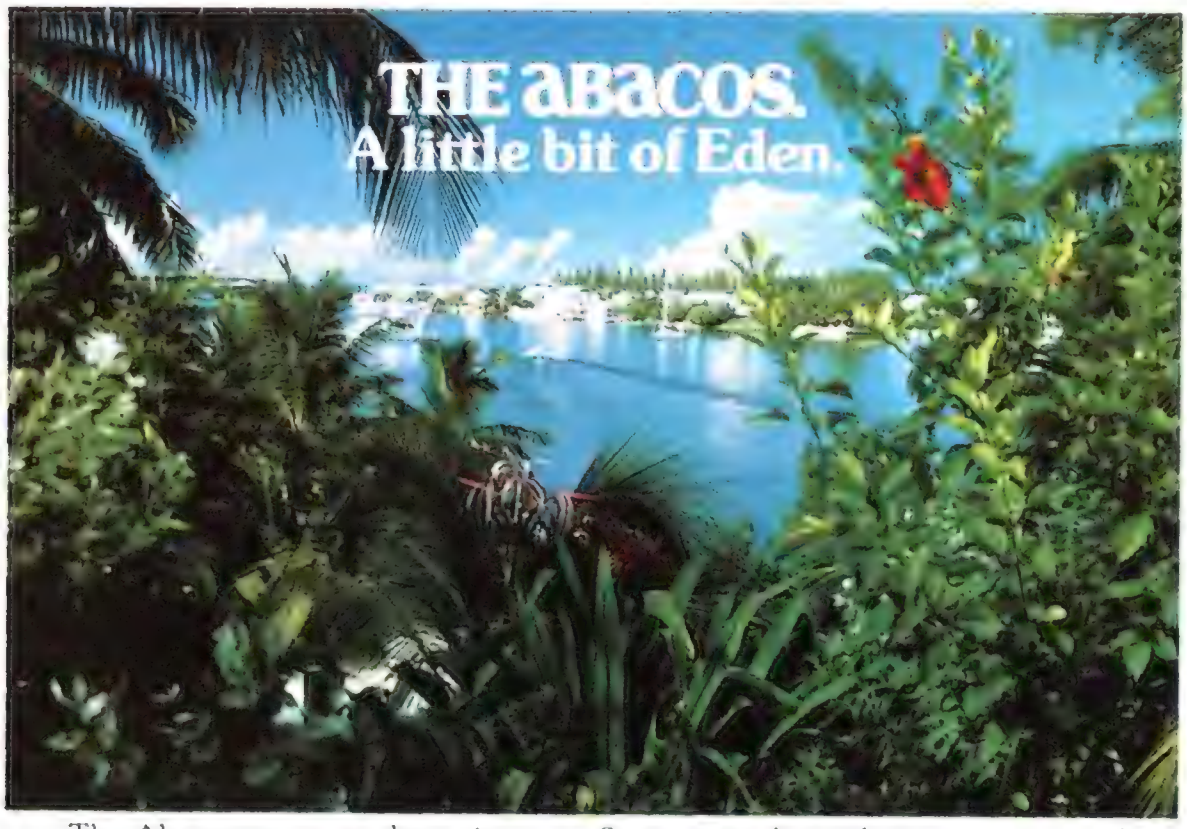

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ference between "I was still the mild, money-wild type of child that's styled 'commuter' " (1919) and the "Do do that voodoo that you do so well" that ten years later so effectively punctuated "You Do Something to Me."

More remarkable than the changes, which one would expect during 50 years, is the persistence of attitudes, themes, devices. There has always been more wit than warmth in Porter's work. "Night and Day" notwithstanding, he best celebrates love comically ("You're the Top") or in parody ("Wunderbar"). He seems more comfortable with the transience of love; even in "I've Got You Under My Skin," that warning voice repeats and repeats, "Don't you know, little fool, you never can win." It is sex rather than love that animates many of his songs (the naughtiness of the 1920s gave way to something like raunchiness by the late 1930s), and some of his most amusing songs—"My Heart Belongs to Daddy," "Always True to You in My Fashion"—depend on the commercial value of sex.

One of Porter's characteristic devices is the use of celebrity names, place names, trade names, often in unlikely contexts—Lassie, for instance, in "I Hate Men" from *Kiss Me, Kate*. Although he has songs that mock the process ("Public Enemy Number One" in *Anything Goes*),

Cole Porter works his magic in New York apartment. It could be "Abracadabra"!

he cannot help dragging out the latest names, often in catalogs (like "Farming" from *Let's Face It*) that recall the Yuletide greetings Frank Sullivan did for years in *The New Yorker*. There are, happily, clever juxtapositions, such as "a symphony by Strauss" and "Mickey Mouse" in "You're the Top." There are also references so closely tied to immediate events that their point has long since evaporated. After an avalanche of names, the almost austere "Just One of Those Things" comes across as one of Porter's most impressive creations.

The distillation of the proper names in *The Complete Lyrics* provides a social history of sorts and the book itself is a skeletal biography and an indispensable tool for Porter scholars. General readers may not want to read it through; it is more for browsing, stopping over old favorites and new surprises. The collection is at its most charming with those lyrics for which you carry the music in your head.

Gerald Weales
Professor of English
University of Pennsylvania

The Making of a Continent
Ron Redfern
Times Books, $27.95

This is a superb book. At first glance it appears to be a geology text, a strikingly illustrated account of the origin and evolution of the North American continent. On closer examination the reader will find that, in addition to the geological material, the book presents an engrossing story of how the natural history of the continent has influenced the human history from the time of the earliest traces of habitation to the Space Age.

The book opens with the author, on a glorious mid-October morning, contemplating the view from a large block of limestone perched precipitously on the South Rim of the Grand Canyon. To better understand how the individual tectonic provinces form North America, he decided to visit key areas of each province, examine geological and archaeological sites and interview scientists and historians. Recounting his travels in an anecdotal style, he shares his personal quest for learning with his readers. The sub-

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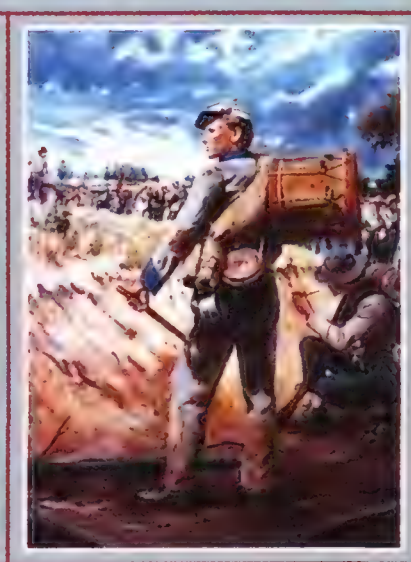

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ject is essentially "plate tectonics," the newly emerged scientific concept which deals with the fundamental geological structure of the Earth and how the Earth's crust is broken into plates that move in relation to one another (SMITHSONIAN, January, February 1975).

Beginning in Iceland where the spreading North Atlantic Ridge separates the North American from the Eurasian Plate, the author investigated 12 types of continental terrain and devoted a chapter to each one. At Yellowknife in Canada's Northwest Territories he examined and photographed the sheer escarpment of the McDonald Fault where pieces of the Precambrian crust collided some two billion years ago, adding new area to the ancient nucleus of the continent. His bush pilot flew over rock structures and stromatolite reefs with such abandon that they ran out of fuel and had to make a forced landing on a remote lake.

Along the Continental Divide in Colorado he describes the fossiliferous Cretaceous strata. And he tells us that the rich potential of the Great Plains as rangelands was discovered quite by chance. In 1859, before winter set in, a destitute prospector turned his oxen loose to die because he had no fodder for them. But at the end of winter, to his and everyone else's surprise, he found that they had flourished on the dried-out grasses. In the chapter "Suspect Terrain," about Alaska, an amalgam of diverse crustal pieces, Redfern discusses the implications of the drowned subcontinent the archaeologists call Beringia, a landmass which, within the past 150,000 years, stretched across the Bering Strait and along the North American and Siberian shores of the Arctic Ocean. Little is known as yet about the history of Beringia, but its importance as a link between Asia and the Americas cannot be overestimated. The Colorado Plateau, the Pacific Margin, the stable continental interior and the Appalachians are among the other areas examined by the author.

Redfern, a skilled photographer, created highly personal, interpretative views of the landscape. He took all of the 185 four-color photographs, including a number of panoramic views presented free of distortion by a method that he developed himself. A double-page spread of a lake-

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side view of Chicago under a delicately streaked sky or of the blue waters of the port of Valdez, Alaska, reflecting the blue and white mountains beyond, are of incredible clarity and beauty.

In addition to the photographs there are numerous dramatically constructed geological cross-sections, schematic maps and sketches, and terrestrial globes showing the tectonics of the North American continent and the adjacent floors of the North Atlantic and Arctic Oceans.

This book will appeal to many types of readers. Nonspecialists from high school age upward will find it a clear, absorbing account of a complex subject; they can rely on the accuracy of what is presented. Scientists and graduate students will use the book to review areas outside their own disciplines. A list of references and additional reading enhances the value of each of the chapters.

The book has been the choice of two book clubs and it formed the basis of a BBC-PBS television program, also called *The Making of a Continent*. For once, a much-publicized volume manages to fulfill its promise.

Ursula B. Marvin
Smithsonian Astrophysical Observatory
Cambridge, Massachusetts

Amazon
Brian Kelly and Mark London
Harcourt Brace Jovanovich, $15.95

One of the many pleasures to be found in this book is a glimpse of probably the world's richest man. That the encounter consists of just a glimpse is no fault of the authors, journalists Brian Kelly and Mark London. Their subject, in a chapter devoted to him, is the American supertanker-magnate, billionaire Daniel K. Ludwig. He is such a bear for privacy that he has granted only two interviews in his 85 years. Indeed, as perceived by Kelly and London, Ludwig's insistence on keeping his own counsel proved to be a tragic flaw.

The story begins about 15 years ago when Ludwig was casting about for a project to occupy his declining years. Convinced that wood was going to be in direly short supply by the end of the century, and well aware that the Amazon Basin is the largest expanse of undeveloped land left on Earth, he bought a tract of

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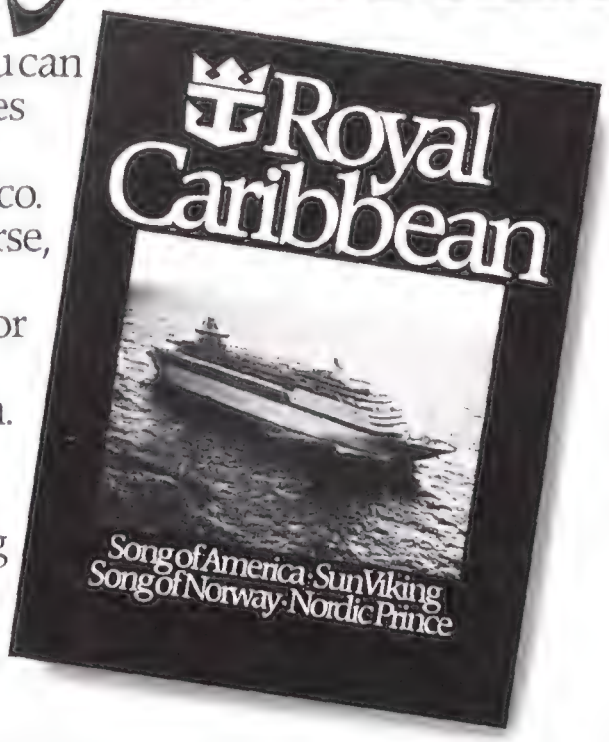

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land in northeastern Brazil as large as Connecticut and Rhode Island combined. There he set in motion a massive tree-farming project, on which he lavished close to a billion dollars.

The scheme surmounted one environmental disaster after another only to fall victim to political unrest. Brazil's land-hungry poor questioned the fairness of allowing a Yankee to own so much of their country, and Ludwig's penchant for going it alone left him with few allies in the government. Brazil's leaders decided to placate their citizens by stepping aside and exposing the project to the machinations of the national bureaucracies. In 1981 Ludwig gave up, selling out to a Brazilian consortium for a fraction of his investment.

Ludwig's saga is worth dwelling on not just for its intrinsic interest but also because it gives a sense of the Amazonian scale. Colossal as his project was designed to be, in the end it only pockmarked the region. In their first chapter, Kelly and London recite some of the extravagant statistics that are applied to the Amazon. "If it were a country, the Amazon [basin] would be the ninth-largest in the world. . . . The Amazon basin is drained by 200 major tributaries, 17 of which are more than 1,000 miles long and ten of which discharge more water than the Mississippi. In all, the basin holds one-fifth of the fresh water in the world. . . . The vegetation that covers the basin is one-half of the remaining forest on earth."

The book's focus alternates between long shots of the authors' grueling journeys—often over dirt "highways" that turn sodden with rain—and close-ups of characters they encounter. Most striking are a sad-sack miner who attracts bad luck so magnetically that he is tragicomic, and a shrewd Indian leader who tape-records the promises of every white man he meets.

If Kelly and London were driven at first largely by a thirst for adventure (London had dreamed of exploring the Amazon since boyhood), they are nonetheless seasoned professionals whose aim is to nail down the most elusive statistic of all: the extent to which the forest has been cut, typically for the slash-and-burn farming that produces only a few years' worth of crops before exhausting the thin

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Amazonian soil. (The jungle's lushness is attributable to the hothouse climate and especially the prodigious rainfall.) The figure they ultimately arrive at is roughly five percent, a far cry from the 30 percent they had heard before leaving the United States. Yet they see no reason to cancel the ecological alert: data supplied by a biologist with Brazil's National Institute of Amazon Research disclose a doubling of the rate of damage between 1975 and 1978. One need not be a mathematician to understand that unless this rate slackens, the forest is doomed and the global climate vulnerable to drastic change.

Kelly and London obviously worked hard to gather their material, making two lengthy trips to the region and withstanding a barrage of tropical maladies. The fruit of their labors is a superior and absorbing State of the Amazon report.

Dennis Drabelle
Washington, D.C., environmental writer and attorney

The Profession of Arms
General Sir John Hackett
Macmillan, $24.95

The Red Army pours through the Fulda Gap and into West Germany, threatening to overwhelm the NATO forces arrayed against it. Such a scenario has kept NATO military planners awake nights for more than 30 years. It is also the premise of General Sir John Hackett's best-seller of a few years ago, *The Third World War: August 1985*.

Sir John, whose erstwhile command of the British Army of the Rhine led him to know whereof he spoke, has now produced *The Profession of Arms*, both a history of, and a set of ruminations on, soldiering as a career. Given the prominence of the American military in the news these days and the renewed prestige of the armed forces in a society no longer at war with itself over the war in Vietnam, this is a timely book.

Sir John's historical survey sweeps from Sparta through the Middle Ages to the French Revolution and down to our own day. Unfortunately, his tour of the long centuries from the Battle of Plataea in 480 B.C. to Arnhem, the disastrous Allied airborne operation in which he distinguished himself in 1944, is too brief to

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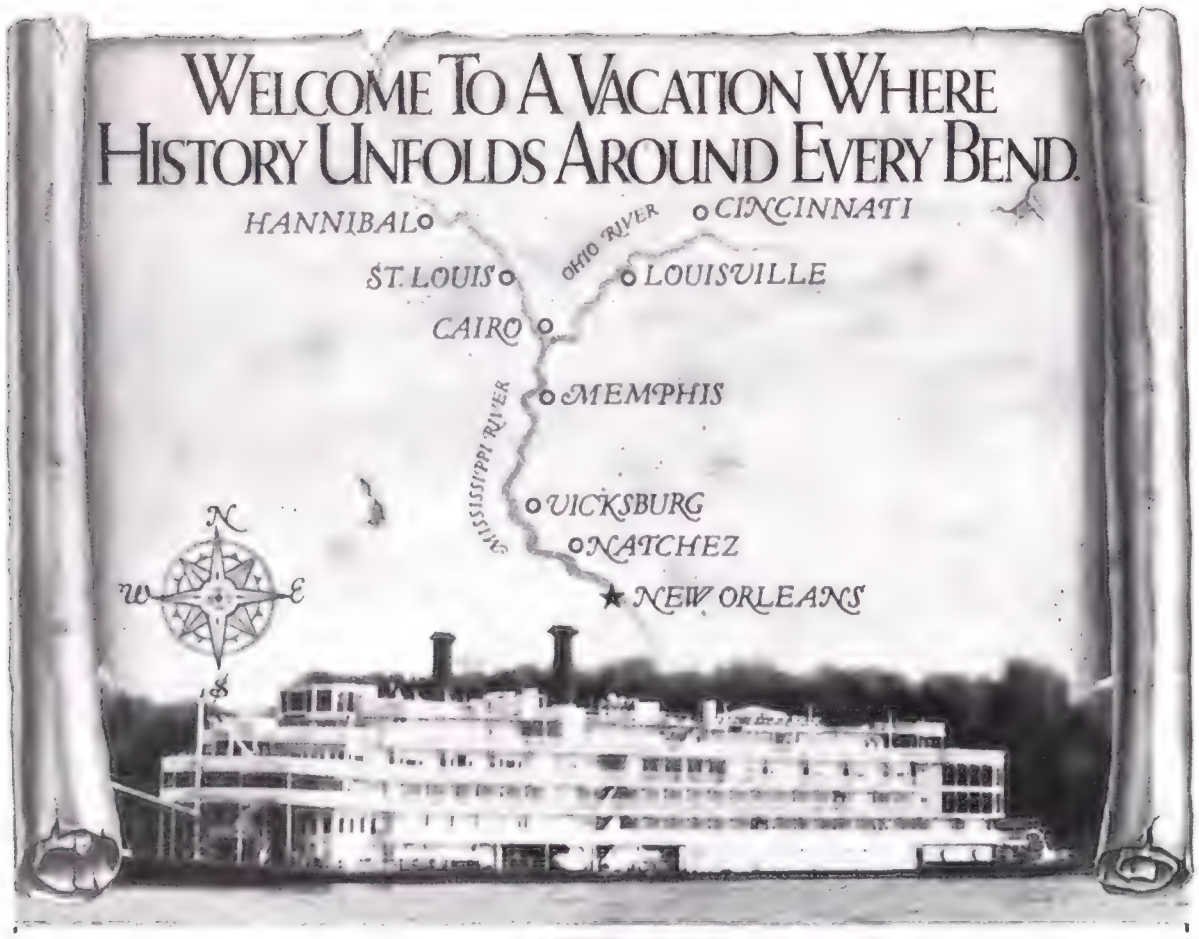

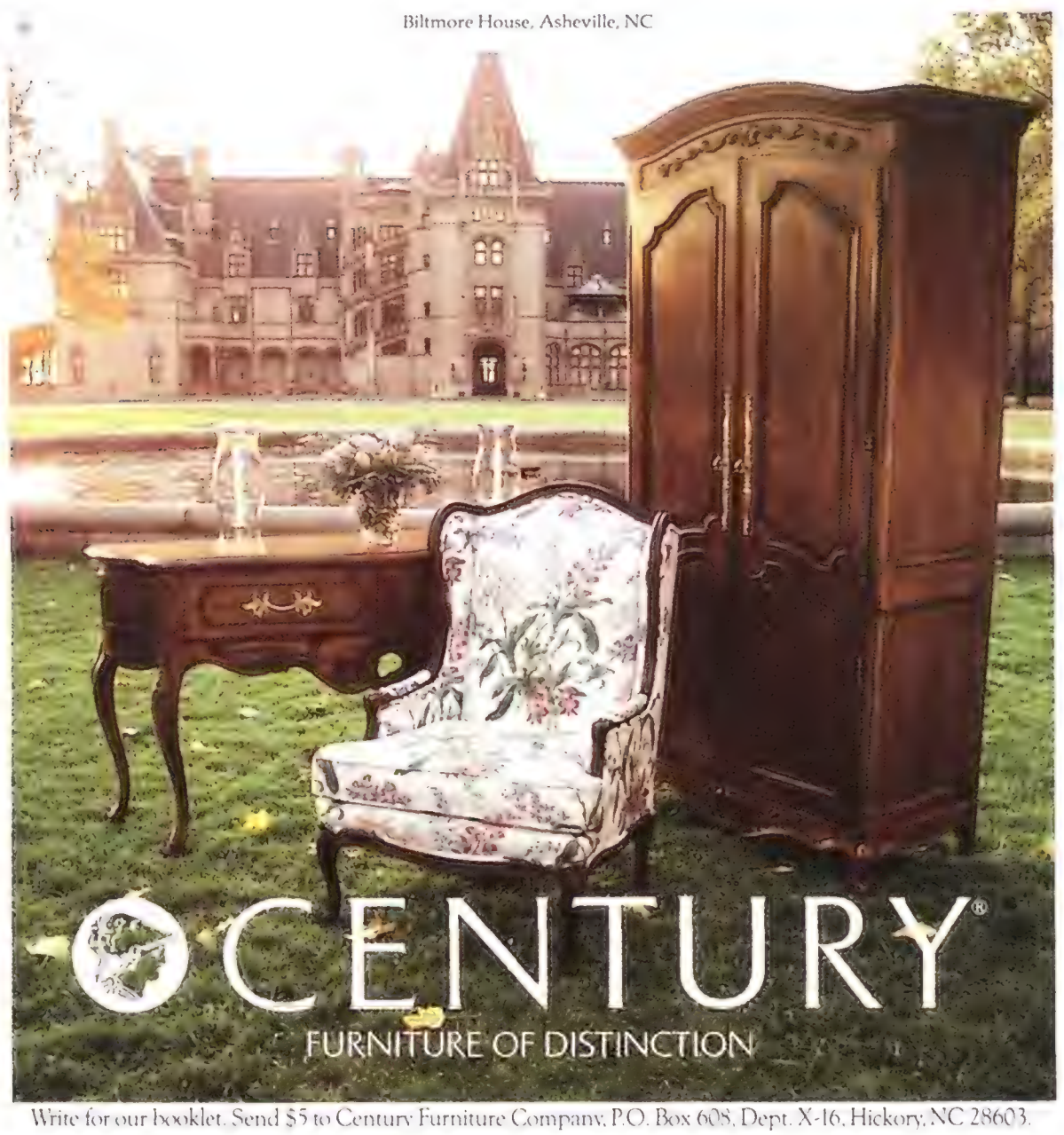

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give more than a glimpse of the vast changes in weaponry and organization that made the battlefield a steadily more lethal place.

What makes Sir John's book interesting is his own understanding, drawn from a lifetime of experience, of what it means to be a professional soldier. The management of organized violence is an odd profession, when you think about it—as odd, in its way, as that of the surgeon licensed to wield a knife on human flesh. What makes soldiering different from, say, lawyering or teaching? In Sir John's view, the military is set apart from most other groups by "the unlimited liability clause in a soldier's contract. When men are unprepared for this, and it is invoked, the results can be disturbing."

For a very long time indeed, fulfilling such a contract was left to men of independent means, skillful (and sometimes not so skillful) amateurs, of whom the Duke of Wellington could stand as one great example and General George Washington as another.

American readers will be especially interested in Sir John's remarks on the period between the Civil War and the outbreak of the First World War, which saw "the emergence of a distinctive American professional military ethic, with the American officer regarding himself as a member no longer of a fighting profession only, to which anybody might belong, but as a member of a profession which, if not accepted as learned, could still be intellectually demanding, and one whose students were students for life."

Important sectors of American society still don't regard soldiering as a learned profession, even though an officer holding general or flag rank is likely to have earned one or more advanced degrees and to have spent as much of his or her time in classrooms as in the field or at sea. Still, irreverence toward the military and skepticism with respect to its pretensions is undoubtedly to be preferred, in a democratic society, to the kind of fawning deference that led Prussian businessmen to have "Reserve Second Lieutenant" printed on their calling cards.

J. E. Talbott
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Additional reading

Computers and children (p. 42)

"Using Microcomputers to Foster Progress in Reading and Writing" by Teresa Rosegrant, *Now That You Have All Those Computers, What on Earth Are You Going to Do With Them?*, edited by Stanton Leggett, Pluribus Press (Chicago), Spring 1984

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Smithsonian highlights

Spring will soon arrive (never soon enough, it seems), bringing with it Smithsonian's special weekend celebration for music lovers. The Twelfth Musical Weekend is being held this year April 27-29. Among its highlights will be the Metropolitan Opera performing Mozart's "The Abduction from the Seraglio"; a concert using 18th-century instruments (below) from the Smithsonian's outstanding collection; and a champagne breakfast with music in the Bird House of the National Zoo. For details and to make reservations, write: Musical Weekend, Room 4124, NMAH, Smithsonian Institution, Washington, D.C. 20560.

Special February exhibits and events

National Museum of American Art
The Prints of Howard Norton Cook (through May 13) Lithographs, engravings, intaglios of New York City, New England villages, Southwest Indians.

Musical Weekend concert will feature 18th-century instruments at NMAH.

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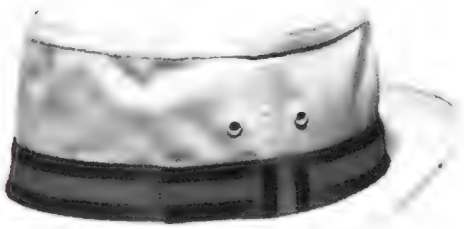

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Renwick Gallery
Fanfare (February 14-July 8) First of a three-part exhibition; this one traces evolution of 18th-century European fans.

National Portrait Gallery
Artists by Themselves (through March 25) Portraits and self-portraits of major American artists from the National Academy of Design.
Arnold Genthe: The Celebrity Portraits (through March 25) Seventy photographs of Greta Garbo, Sinclair Lewis, Sarah Bernhardt, other notables.

Hirshhorn Museum & Sculpture Garden
Art From Italy: A Selection from the Permanent Collection (February 1-April 8) About 50 paintings and sculptures, mostly from 1940s through 1960s.
Dreams and Nightmares: Utopian Visions in Modern Art (through February 12) Artists' views of modern life.

Cooper-Hewitt Museum (New York)
American Enterprise: Nineteenth-Century Patent Models (through April 1) See page 120.
Netsuke (through April 8) About 400 miniature Japanese sculptures in wood, ivory and other materials.

Freer Gallery of Art
The Ramayana (through April 15) See *Highlights continued.*
Islamic Manuscript Illumination (open indefinitely) Nineteen folios.
Rediscovering the Che School (February 14; 8:30 P.M.) Lecture by Richard M. Barnhart on Ming Dynasty paintings.

Cumberland Girl is in NMAA's exhibit, "The Prints of Howard Norton Cook."

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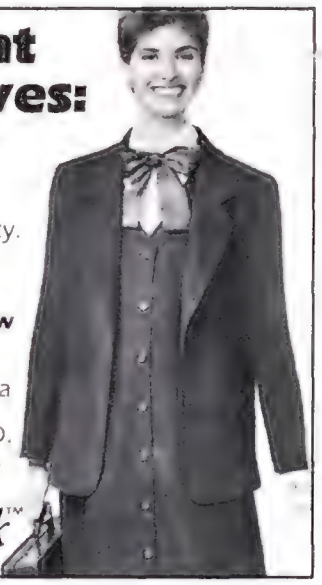

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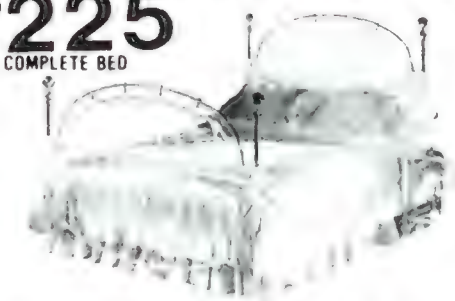

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National Museum of Natural History
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The Nazca Lines: Ancient Peruvian Desert Art (through April 16).

National Air and Space Museum
Telescopes for Everyone (February 4; 9 A.M.) Monthly sky lecture.
The SR-71 Blackbird (February 9; 7:30 P.M.) Col. Robert L. (Fox) Stephens presents film and discusses this aircraft.

Resident Associate events

To become a Resident Associate, or to find out about the many other programs this month, or for price and ticket information, call 357-3030:
Geoffrey Holder, Instant Theater (February 15; 8 P.M.) Evening of dance, character improvisation, mime.
Gewandhaus Bach Orchestra of Leipzig (February 23; 7:30 P.M.).
Smithsonian Chamber Players (February 21, 22; 8 P.M.) Austrian 17th-century music is played on original instruments.
John Eaton Brunch Concert (February 26; 11 A.M.) Jazz pianist interprets "Stormy Weather," other music of Harold Arlen; brunch is included.
Biopics (Feb. 14, 21; March 6, 13, 20, 27; 7 P.M.) Six-week series shows biographical films.
Boley (February 1-19) Discovery Theater presentation is a play about a turn-of-the-century town established by State of Oklahoma for black settlers.
African Moods and Melodies (February 25; 2 P.M.) Nubian Theatre Company mixes folk music, dance and folk tales.
In the Footsteps of Marco Polo: A 20th-Century Odyssey (February 16; 8 P.M.) Film and slide-illustrated lecture by Harry Rutstein, who retraced Polo's route.
From Lhasa to Everest: Monasteries and Mountains of Tibet (March 5; 8 P.M.) Slide-illustrated lecture by Edwin Bernbaum.
Design Since 1945 (February 27; 8 P.M.) Lecture on international home design by Kathryn B. Hiesinger.
The Face of American Medicine (seven Monday evenings beginning February 13) Series offered in cooperation with Washington Hospital Center includes lectures and tours.
Masterpieces of Japanese Cinema (eight Tuesday evenings beginning January 24) Lectures, screenings offer films of Akira Kurosawa and three others, including new-wave work of Masahiro Shinoda.

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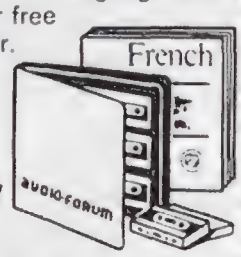

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Associates in Virginia and Utah will have the opportunity to attend Smithsonian lectures, workshops and seminars when the Regional Events Program travels to Roanoke (February 8-12) and Salt Lake City (February 24-March 2). The Roanoke program features lectures on nature photography, Appalachian art and America's legendary theatrical impresarios. Lectures on Polynesian art, plate tectonics and a performance of American folk music will highlight the events in Salt Lake City. Associates should have received invitations by this time.

Later this year, the Regional Events Program will travel to San Antonio (March); Winston-Salem (March); Spokane (April); Sioux Falls and Rapid City (April); Moorhead and Fargo (April); Albuquerque (May); and Cleveland, Columbus and Cincinnati (June). For further information, write: Regional Events Program, A&I 1208, Smithsonian, Washington, D.C. 20560.

The Regional Events Program travels to cities throughout the country each year to provide Associates living outside Washington, D.C., with Smithsonian-originated educational programs in their home communities. The series is cosponsored by local museums and by cultural and scientific organizations.

Smithsonian on the air

Radio Smithsonian: Features on this weekly half-hour program include a look beyond Orwell's *1984*; the success of bird ecology in the United States; and an appreciation of the Wright Brothers.
Smithsonian Galaxy: Short radio features explore history, science, art.
Here at the Smithsonian: Two-minute spots include a look at *M*A*S*H* exhibit.

To find out what stations in your area carry these radio and TV programs, write: Office of Telecommunications, MNH Room C222B, Washington, D.C. 20560.

Exhibition catalogs

Catalogs available at this time include:
The Art of the Cameroon ($15; paper)
Pain and Its Relief ($5.50; paper)
Inventing Standard Time ($2; paper)

To order, send check or money order to: Museum Shops, Box 44083, Washington, D.C. 20026-0083. Include 15 percent of total purchase to cover postage and handling (minimum, $1.75).

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The Contributing Membership Program supports the Smithsonian's research and educational activities through annual

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membership contributions in five categories: Supporting, $50; Donor, $100; Sponsoring, $250; Sustaining, $500; and Patron, $1,000. (Contributions are tax-deductible within legal limits.) In addition to all benefits of Smithsonian Associates, Contributing Members attend elegant evening previews of museum exhibitions; are given behind-the-scenes museum tours; and receive a special edition of a richly illustrated Smithsonian publication and the Smithsonian Engagement Calendar. For further information, please contact the Contributing Membership Program, A&I 1190A, Smithsonian Institution, Washington, D.C. 20560.

Smithsonian Institution Traveling Exhibition Service

SITES circulates exhibitions to hundreds of cities outside Washington. To sponsor a show in your community, write: SITES, Smithsonian, Washington, D.C. 20560. Here are some February exhibitions:

Mobile (February 4-March 4) *John Singer Sargent: Drawings from the Corcoran Gallery of Art*, Fine Arts Museum of the South.

Chicago (February 4-March 4) *The Long Road Up the Hill: Blacks in Congress, 1870-1983*, Museum of Science & Industry.

Holland, Michigan (February 18-March 18) *Korean Drawing Now*, Hope College.

Athens, Ohio (February 20-March 16) *Invisible Light*, Trisolini Gallery of Ohio University.

Columbus, Ohio (February 11-March 11) *Family Folklore*, Historical Society.

Baltimore (February 11-March 11) *Galápagos: Born of the Sea*, Science Center.

Oak Ridge, Tennessee (February 4-March 4) *Flying Fantasies: Butterflies and Moths*, Children's Museum.

Membership benefits when visiting the Smithsonian

For members planning a Smithsonian visit, a fact-filled pre-visit packet is free; send postcard request or phone Associates' Reception Center, Smithsonian Institution, Washington, D.C. 20560, (202) 357-2700; for hearing impaired, TDD (202) 357-1729. Allow two weeks for receipt.

Upon arrival, begin your visit at the Associates' Reception Desk in the castle, staffed daily 10 A.M. to 4 P.M. Special printed materials are part of the cordial welcome as are full details of your benefits which include a half-hour slide/lecture orientation to the 13 museums; dining in The Court; discounts in most Smithsonian shops.

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Highlights continued

A hero's welcome at the Freer

Prince Rama's legendary struggles against the forces of evil are hailed in an exhibition and a new book

The *Ramayana,* India's ancient epic poem relating the life of Prince Rama and his devoted wife, Sita, has a cast of characters that is not to be believed. No problem here telling the good guys from the bad guys.

Rama has to keep the world free from all forms of evil, like the horrific hag-demoness Taraka (right), who rampages through forests creating havoc. Helping him to uphold good are Sita and his faithful brother, Lakshman. Real trouble comes when the 20-armed giant Ravana, smitten with Sita, carries her off by a hank of hair to his island stronghold. With his demon army and his brother, Kumbhakarna, he feels pretty secure. (Kumbhakarna is a giant whose appetite is so ravenous that he has been condemned to sleep for six months for every day he is awake, lest he consume all the food on Earth.) But Rama finds allies: he is joined by the monkey army, led by their valiant general Hanuman, and by the bear army.

All of this action, right through to the last blow of the mighty battle, is depicted in 24 paintings on view at the Freer Gallery of Art through April 15. These works are part of a *Ramayana* manuscript that was painted in the late 16th century for the commander in chief of the imperial Mughal armies. Because these foreign conquerors read Persian, the text is in that language. Portions of text blocks can be seen in several pictures here.

The *Ramayana* is an exhibition that you can take home. Its organizer, Milo Cleveland Beach of Williams College, was inspired by his children to write a story-book version. With support from the James Smithson Society, the Freer Gallery has published the book, entitled *The Adventures of Rama.* It uses the paintings in the show—including numerous details of them—for its illustrations (these pages present a sampling from the book). The Freer recommends that you bring a child with you to this exhibit—although they'll let you in without one.

Constance Bond

With his brother Lakshman beside him, Prince Rama (below) prepares to shoot demoness Taraka (left).

Hanuman (below) flies back to battle with mountain of healing herbs to revive Rama's troops.

Details include a rabbit and one of Ravana's demon guards (above, center).

In panel at right, Rama and Lakshman confer with animal allies' leaders.

The evil, 20-armed giant, Ravana (above), carries off Rama's wife, Sita.

As tensions build, Ravana's enormous brother Kumbhakarna blissfully sleeps.

Join with other Smithsonian Associates

Travel and Study, at Home, Abroad . . . and

As a Smithsonian Associate, you can enjoy the benefit of culturally oriented experiences under the guidance of museum curators or visiting scholars. Your lively curiosity and broad interests have resulted in a comprehensive study program to meet many tastes and budgets.

Domestic Study Tours

Savannah and Charleston March 22-29 or April 8-15: Experience the gracious living of the past in charming seaports with their elegant townhouses, fine antiques and cobblestone streets.

Crafts Today April 26-29: "1984 Forum on 20th-Century American Glass" in Washington features collections, studio tours and lectures on glass from Tiffany to contemporary.

Civil War in Virginia May 2-11: Enjoy springtime in the Shenandoah Valley while exploring historic homes, towns and battlefields that bring to life the eastern campaigns.

Arches and Canyonlands National Parks May 10-17 or September 20-27: Hike through Utah's incredible landscapes on this sequel to our Bryce and Zion trip.

California Dream May 17-25: Travel from San Francisco to Sacramento and Carmel focusing on writers who shaped the early image of the state.

Kentucky May 17-25: Visit historic homes in Louisville, Lexington and Shakertown, plus renowned craft centers in Berea.

Crow Canyon Archaeology May 20-27 or August 5-12: Join archaeologists near Mesa Verde, Colorado, for a dig at an ancient Indian site.

Treasure Houses of Early America May 31-June 7: From Wilmington, Delaware, explore the rich legacy of American antiques and architecture, including the renowned Winterthur collection.

Connecticut Antiques June 17-24: Discover New England's heritage while learning about architecture and decorative arts in the 18th-century villages of Litchfield, Wethersfield and Farmington.

Alaska June 29-July 13: Cruise the Inside Passage, enjoy five days at Camp Denali, a wilderness retreat in the shadow of Mt. McKinley, and visit the Eskimo villages of Kotzebue and Nome.

Delta Queen October 18-26: Steam up the Mississippi from New Orleans to Memphis with two renowned Southern historians.

Coming in July . . . Experience the thrill of a white-water adventure down Utah's Green River or hike to spectacular heights in Glacier National Park, plus a family weekend at the Smithsonian for children ages 7-14.

Washington "Anytime Weekend": Brighten your winter with an economical weekend visit to your choice of Smithsonian museums. Package includes hotel, meals, sightseeing and exclusive tour of Smithsonian castle. Reservation and payment must be received at least ten days prior to arrival.

Foreign Study Tours

These tours range in size from small group experiences to charter adventures and vary in price from low-cost to deluxe, depending on the type of travel, destination and length of trip:

People's Republic of China, 1984: Retrace the Silk Route, climb China's sacred peaks, cruise the Grand Canal or Yangtze River, explore back roads, study decorative arts and antiques, or journey by train through the countryside. Exclusive tours are led by a Sinologist and include intensive pre-tour briefing.

Morocco March 8-24: Explore vibrant imperial cities and discover the powerful beauty of historic desert and mountain villages.

Ancient Civilizations March 11-31: A unique study voyage aboard the *Argonaut* traces the development of Western civilization with visits to historic sites in Egypt, Jordan, Israel and Greece.

Rouen and the Norman Countryside March 31-April 15 or October 6-21: The ancient city of Rouen, capital of lush Normandy, provides a superb setting for walking tours, museum visits and special excursions nearby.

Canals and Old Masters April 10-24: Art museums, historic tours and spring flowers highlight four days in Amsterdam. Then sail by riverboat to explore the cobbled streets of medieval Dutch and Belgian port cities, plus Brussels.

London and the English Countryside April 29-May 13: Delve into London's 2,000-year heritage with lectures, walking tours and theater followed by travel excursions through England's lush spring countryside.

History and Romance of the Rhine May 14-29: Following a program in Zurich and Basel, embark on our chartered ship for a seven-day study voyage to the great castles and cathedrals on the Rhine.

Swiss Countryside May 26-June 10 or September 1-16: Explore the majestic, romantic mountain world of Switzerland's Bernese Oberland while residing in Lenk.

Wild Highlands of Scotland May 31-June 18: Based in a castle, observe shy wildlife and the brooding landscapes of loch and moor. Visit the Isle of Skye and meet local residents to learn about this remote and historic region.

Seminar in Florence June 8-24: Study the Florentine Renaissance while living in a 15th-century villa. Take part in lectures, language classes and field trips into the Tuscan countryside.

Trans-Siberian Express June 10-July 3: Take the legendary train across beautiful eastern Siberia followed by a choice of travel seminars to seldom-visited Outer Mongolia, exotic Central Asia or the czars' cities of Moscow and Leningrad.

Greece June 16-July 1: A full program in Athens is followed by visits to the renowned sites of ancient civilizations.

Cotswold Countryside June 24-July 8 or July 8-22: Stay in Cirencester, in the midst of England's ancient green hills, and visit archaeological sites, market towns, woolen mills and historic homes.

Iceland July 24-August 7: Travel a rugged terrain of glaciers, hot springs and majestic waterfalls.

Island World of Britain July 30-August 13: From Southampton, circumnavigate Great Britain aboard the *Argonaut.*

Coming in August . . . **Scandinavia and the Baltic Voyage** and **Kenya Wildlife Tour.**

Write National Associates, A&I 1278 Smithsonian Institution, Washington, D.C. 20560 or call (202) 357-2477 for specific tour brochures

in Washington

Selected Studies Seminars

Enjoy the treasures of the Smithsonian in unique, popular programs and special behind-the-scenes tours. Choose from:

French Impressionist Painting March 4-9: William Kloss discusses the masterpieces of Monet, Degas, Renoir and others in a program being repeated owing to popular demand. Includes slides from the world's great collections, and tours in the renowned museums of Washington.

Connoisseurship of Rugs April 8-13: Masterpieces from the Textile Museum—the only museum in the West devoted to rugs from virtually every region of the world—are used to illustrate the rich designs and techniques of the major rug traditions. These prized rugs, as well as others from fine museums and private collections, will be analyzed as great works of art and considered in their historical and cultural context. Also includes care and repair of rugs, the antique and semiantique rugs which are collectible today, and a round-table discussion of participants' rugs.

Gardens by Design April 29-May 4: Celebrate spring in the outstanding gardens of the Washington, D.C., area with their profusion of flowering shrubs, trees and plants. Experts focus on the art of planning and designing gardens—whether small or large, public or private—in in-depth lectures and tours of major horticultural sites in and around Washington.

In Tucson, Arizona

The New Astronomies May 6-11 or May 13-18: Springtime in Arizona at two of the most advanced scientific research facilities in the world: the Fred Lawrence Whipple Observatory (formerly Mt. Hopkins) and Kitt Peak National Observatory with lectures and tours by their directors and eminent staffs.

18th-Century French Art July 15-20: An unprecedented exhibition at the National Gallery of Art of the wistfully beautiful art of Watteau, highlighted by the inclusion of his greatest masterpieces from the Louvre and West Berlin, will be the focal point of this seminar taught by William Kloss on the art of France in the Age of Voltaire. Also included in the exhibition and seminar will be the paintings, drawings and prints from great American and European public and private collections.

or (202) 357-2475 for seminar brochures.

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By David Snell

Celebrated birthdays: a real Kan *of* Pop?

Dear Bill:
Your letter really clanged my chimes. I mean, you didn't exactly come right out and say the U.S. ought to switch over to the Maya calendar. But what the heck, *I'll* say it. How much longer can we continue to ignore a calendar with catchy month names like *Pop, Zip, Zotz, Mac* and *Cumku*? Not to mention day names like *Kan, Oc* and *Manik*.

I did not rush to judgment. After getting your letter I went to the public library to look up Calendars, history of. I also wanted to check up on Washington, George, because it's always rankled me that the birthday of the Father of Our Country has become a holiday version of the floating crap game. This one is typical. It "falls" on Monday, February 20, the anniversary of a date Washington wasn't even remotely born on.

I realize that in rejiggering such things Congress was only trying to preserve the treasures of our American heritage, in this case the three-day weekend. But I wondered what Washington himself would think about playing fast and loose with calendric truth—particularly in the matter of his very own birthday. So I hauled down the *Encyclopaedia Britannica*. Everybody knows Washington was born on February 22, right? Wrong. To my amazement I discovered that for the first two decades of his life he went around telling people he was born February 11.

Was he deliberately lying? It hardly seemed likely. The explanation, it turned out, was simple. In 1752, by act of the British Parliament, the month of September got itself chopped down to just 19 days, skipping overnight from the 2nd to the 14th. The British had decided to cut loose from the venerable Julian calendar which had been in effect since Julius Caesar's time, but by mid-18th century was 11 days behind the exact date. Hence Britain's switch to the newer and more accurate Gregorian calendar, proclaimed by Pope Gregory XIII in 1582, a mere two centuries before!

When the switch was made, there were arguments and fistfights over wages for the shortened month of September. Some members of Parliament may have regretted they hadn't finessed the situation the way Sweden had. Instead of yumping onto the Gregorian bandwagon in one traumatic leap, the Swedes, starting back in 1700, had just skipped a succession of February 29s, the Leap Year days, until they caught up.

Colonial resentments against the mother country had not yet come to a boil, so when news of Parliament's action arrived in America, there was no outcry about vexation without representation. And no dumping of crated Gregorian calendars into Boston Harbor. Despite the undoing of everything he stood for—birthdaywise, that is—George Washington went along with the calendar reform.

At least he did so publicly. Five months after the freakishly abbreviated September had become history, the boy became a man. On his 21st birthday Washington officially accepted the date as February 22. In public, that is. Unfortunately, while browsing further on the reference shelf, I came across another shocker: *Privately, Washington went right on celebrating his birthday on February 11!*

Bill, you can see what a can of worms this opens. In the first place, the date of his private observances was always February 11 as shown on the new Gregorian calendar. So that for years he was committing a birthday deception in his heart, not once but twice! February 22 was just plain 11 days wrong, reckoned by the heart. The *old* 11th, the one beloved of childhood memory, was no help either, having dropped back a full month to become January 31. How did George feel on birthdays? What explanations did he offer acquaintances when they inadvertently presented birthday greetings on January 31—or on February 11?

On my reference shelf at least, history did not seem concerned with these questions. But thinking on them I now began to wonder what would have happened if, instead of passing the Calendar Reform Bill, the British Parliament had voted it down. The date change probably would not have affected the outcome of the American Revolution. But it would certainly have messed up the Fourth of July. We'd have been stuck with fireworks on June 23, a thoroughly unpoetic date that even George M. Cohan might have had trouble accommodating to a song lyric.

During the past century or so, it turns out that a number of proposals have been put forward for a really accurate world calendar. The Gregorian now has its little foibles, too, it would seem. If we ever get around to a vote, like you, I'd gladly give up the Gregorian for the Maya.

With their New Year's Day celebrated on our present July 26, our Fourth of July would coincide with a date designated by the Maya as an *Ik* of *Cumku*. I imagine George M. Cohan could have coped with that. Even better, if we could make their New Year's Day July 4, as I propose, we might be able to celebrate American Independence on what the Maya called the *Kan* of *Pop*.

Truthfully yours,

Dave

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